

Technische Universität Darmstadt

User surveys of urban open spaces in Darmstadt

National report Germany

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Project Partners

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PRISMA – Planning and Research Consultants
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City of Athens
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Introduction

As part of the project PREHealth, face-to-face interviews and an online survey were carried out in four European cities: Darmstadt (Germany), Eindhoven (The Netherlands), Athens (Greece) and Győr (Hungary). The objective of the interviews was to identify 1) the users of the open public spaces including their socio-demographic characteristics and lifestyle, 2) their patterns of behaviour in the open space and 3) the benefits or improvements that the users expect from the use of the open space. This report describes the results obtained in Darmstadt and considers the face-to-face interviews and the online survey separately.

Report of the face-to-face interviews in Darmstadt

1. Introduction

In Germany, the face-to-face survey took place on four different open public spaces in the city of Darmstadt: Großer Woog and surroundings, the skate park and Kapellplatz, the Rudolf-Müller-Anlage and the Ostbahnhof (see Figure 1).

The face-to-face survey was made “on site” by five students at different times (morning, afternoon and evening) and different days of the week (including weekends) in summer (August 2017). The total sample was of 119 interviewees. In addition to the survey, the students analysed the movement and behaviour of the users.

- A. Kapellplatz and skate park: The area of the Kapellplatz had been a cemetery, when in 1866 most of the tombs were removed. Nowadays the Kapellplatz is a public, small park with scattered gravestones. It contains the ruins of the former city chapel (destroyed during the Second World War), trees and mosaic pavement paths. The Kapellplatz is considered as a local open space that serves to the neighbourhood. In addition, near the Kapellplatz there is a skate park, which is visited not only by citizens of Darmstadt but also by other people from the region. The skate park is in the city centre and attracts many young people.
In total, 28 interviewees filled the survey (64% were men).

- B. Rudolf-Müller-Anlage: The area comprises wide lawn areas, playgrounds, leisure paths and benches. The area is a local/neighbourhood open space and is located right next to the Großer Woog.
In total, 26 interviewees filled out the survey (54% were men).

- C. Großer Woog: The area of Großer Woog comprises a lake (for recreation and for environmental purposes), playground areas, leisure paths, green lawn areas, and even a small restaurant. The complex is located in the heart of the city of Darmstadt and serves local and regional visitors.
In total, 40 interviewees filled out the survey here (57,5% were women).

- D. Ostbahnhof: The train station Darmstadt East is a transit station of the Odenwald train.
In total, 25 interviewees filled the survey (52% were men).



Figure 1: Four different areas in Darmstadt where the face-to-face survey took place.

As mentioned above, the surveys took place on different times of the day (39,5% of the interviews in the morning, 38,7% in the afternoon and 21,8% in the evening) (see Figure 2) and on different days of the week (73,9% interviews on week days and 26,7% on weekends).

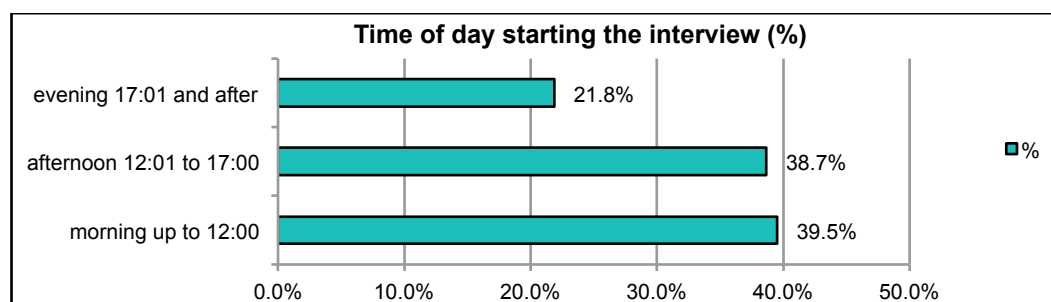


Figure 2: Time of the day starting the interview. Total sample: 119 respondents.

As patterns of usage of the open space, men tend to use more the open spaces in the morning, while women in the afternoon (see Figure 3). Nevertheless, for the Kapellplatz and the skate park, more women tend to visit the open space in the morning and men in the afternoon and evening (see Figure 4). In the case of the Rudolf-Müller-Anlage and the Ostbahnhof, the general tendency remains (see Figure 5). In the case of Großer Woog, the afternoons are popular for both genders (see Figure 6).

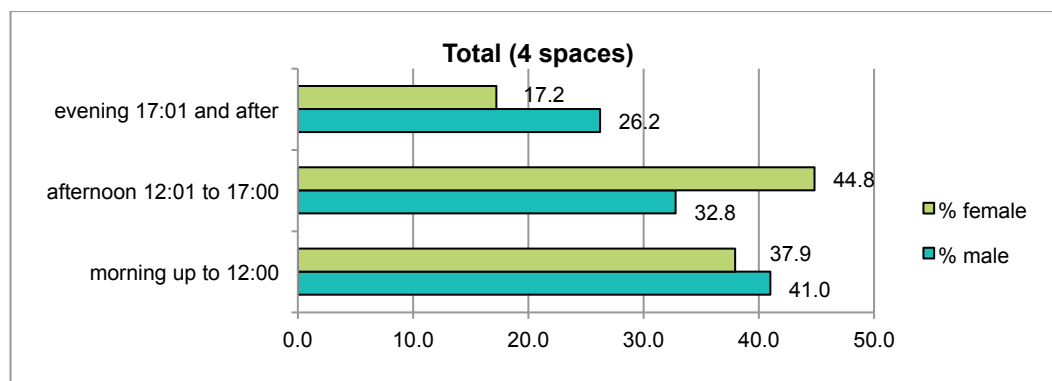


Figure 3: Percentage of users separated by gender using the different open spaces on different times of the day. Total sample: 119 respondents.

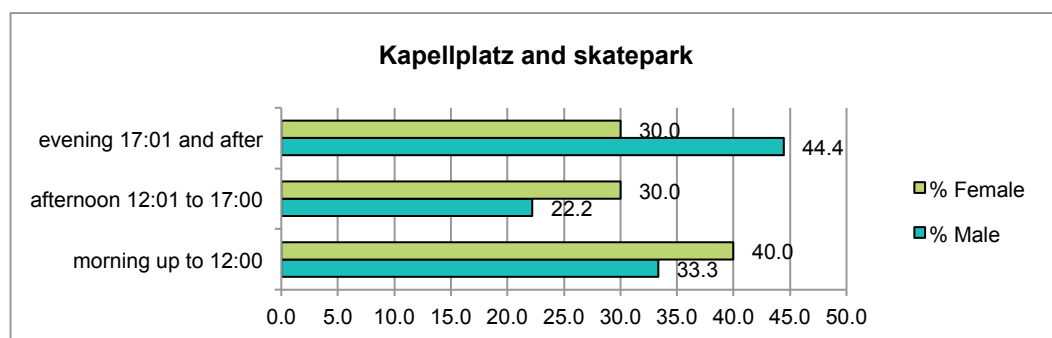


Figure 4: Percentage of users separated by gender using the Kapellplatz and the skate park on different times of the day. Total sample: 28 respondents.

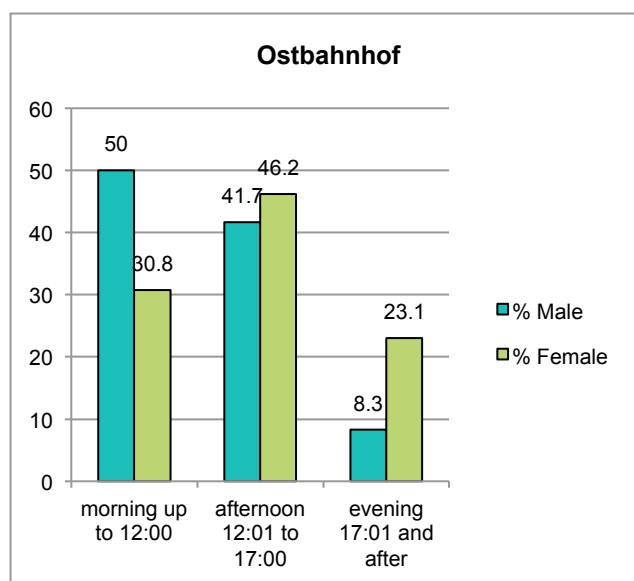
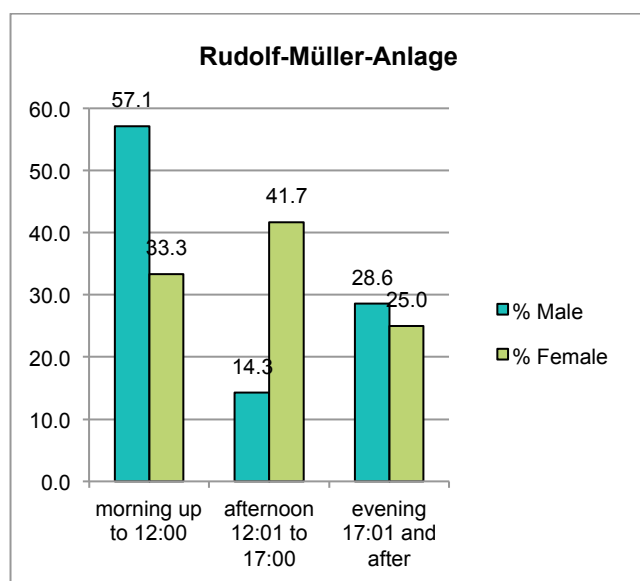


Figure 5: Percentage of users separated by gender using the Rudolf-Müller-Anlage and the Ostbahnhofat different times of the day. Total sample: Rudolf-Müller-Anlage: 26 respondents, Ostbahnhof: 25 respondents.

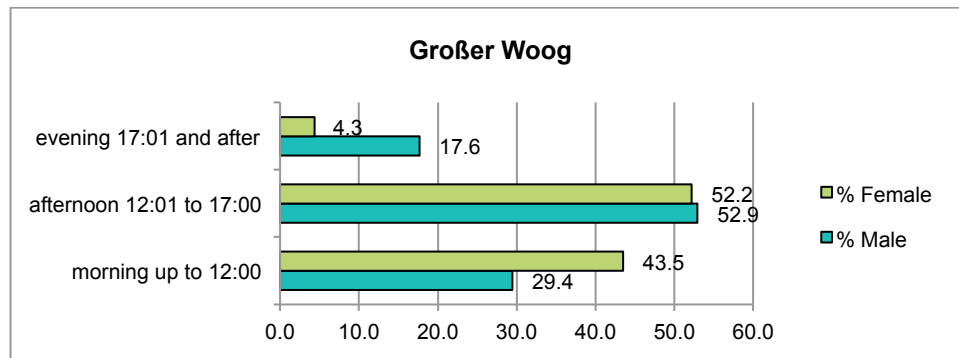


Figure 6: Percentage of users separated by sex using Großer Woog at different times of the day. Total sample: 40 respondents.

Taking into consideration the total number of respondents in the four spaces, it seems to be a pattern: visiting the open spaces during weekdays seems to be more popular for females and during weekend for males (see Figure 7).

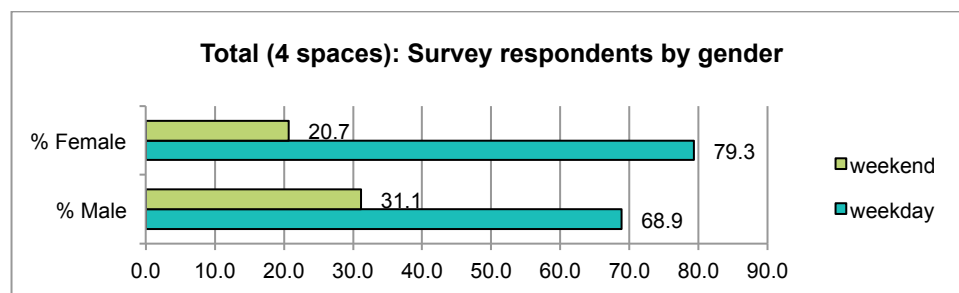


Figure 7: Percentage of respondents on weekdays and weekend by gender. Total sample: 119 respondents.

Nevertheless, there are some specific patterns of usage on each space, although they are merely hypothesis rather than facts due to method limitations and the small number of the sample on each space. For example, in the case of the Kapellplatz and the skate park, both females and males tend to visit more the public spaces during the weekdays. This could be assumed due to the nearby school, but also by size and popularity of the space: the Kapellplatz is considered a local small open space visited mostly during the week days, while on the weekend the visitors prefer to go to other non-local open spaces. But it is questionable that the skate park is mostly visited during the weekdays and not on the weekends.

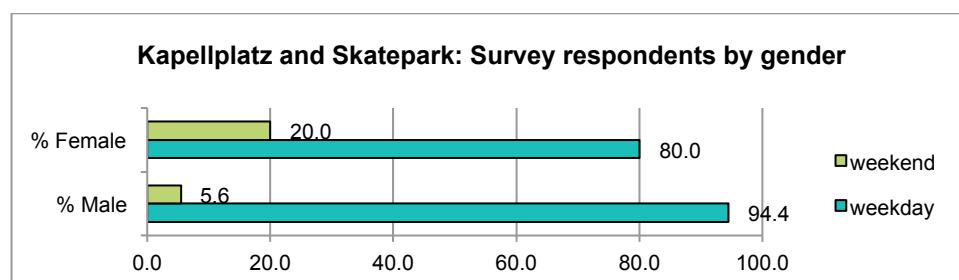


Figure 8: Percentage of respondents on weekdays and weekend by gender at Kapellplatz and the skate park. Total sample: 28 respondents.

In the case of the Rudolf-Müller-Anlage, it is more popular for both females and males to visit the space during the weekend. This space is considered as a popular space for the city of Darmstadt, which contains playgrounds and big lawn areas to rest and relax. Therefore, it could be assumed that is most visited during the weekends by families with children.

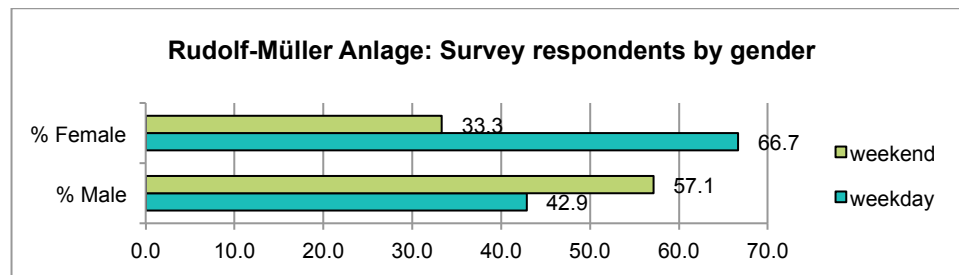


Figure 9: Percentage of respondents on weekdays and weekend by gender at Rudolf-Müller-Anlage. Total sample: 26 respondents.

In the case of Großer Woog, females tend to visit the space during weekdays and males during the weekend. But as mentioned before, this trend can be considered as a working hypothesis.

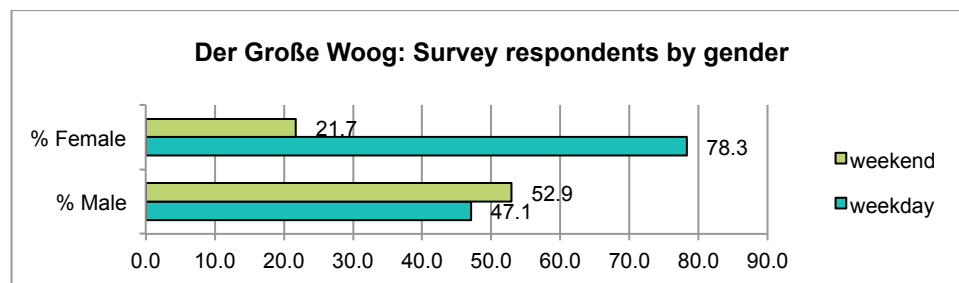
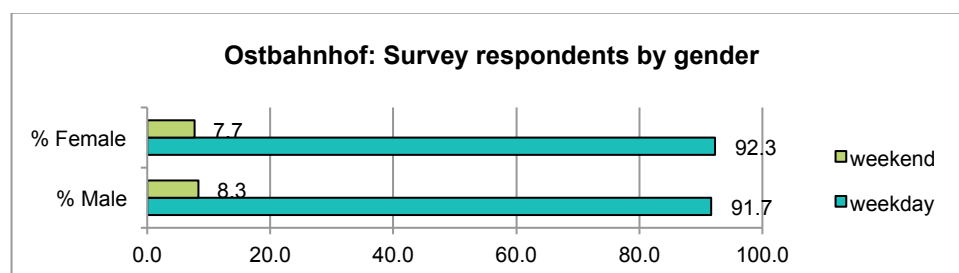


Figure 10: Percentage of respondents on weekdays and weekend by gender at Großer Woog. Total sample: 40 respondents.

In the case of the Ostbahnhof, weekdays appear to be popular for both females and males. It is quite obvious that a train station is mostly visited during weekdays, where public transport is highly demanded.



**Figure 11: Percentage of respondents on weekdays and weekend by gender at the Ostbahnhof.
Total sample: 25 respondents.**

2. The open space users

This section presents, through a frequency analysis of the survey results, the demographic and socio-economic profile of the users of open spaces who were interviewed, their patterns of behaviour, perceived benefits and improvements, and aspects of their life style.

2.1 User profile

Gender

Respondents included men and women at roughly the same proportions (51% and 49% respectively).

Age

Respondents covered a range of ages from 12 years to 65+years, with the highest proportion in the 26-35 years range (see Figure 12).

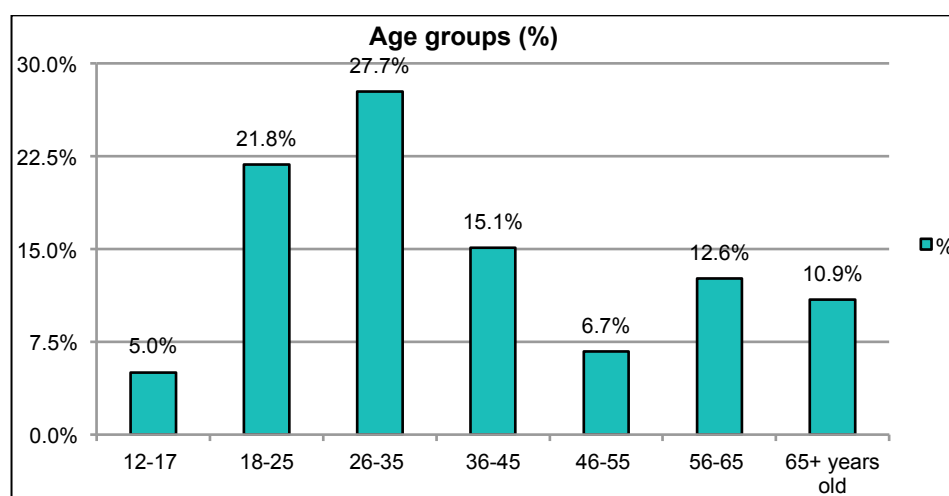


Figure 12: Age profile of the sample. Total sample: 119 respondents.

Education

Respondents cover the whole range of education levels. They are almost equally split between those from primary to upper secondary education level (49%) and those with post- secondary and tertiary education (51%) (see Figure 13).

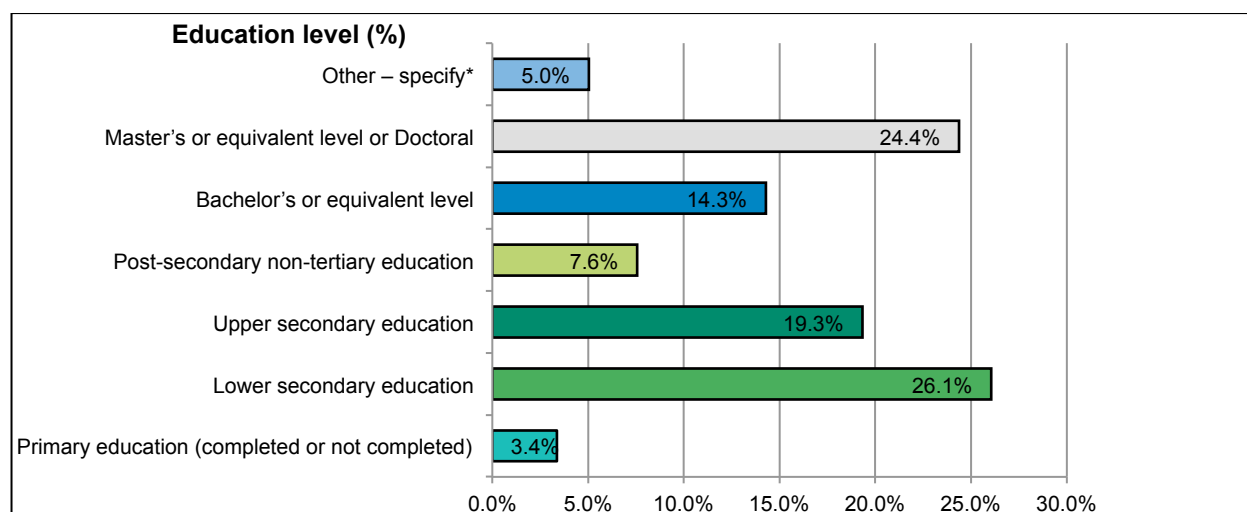


Figure 13: Education profile of the sample. Total sample: 119 respondents.

Employment

Among respondents the majority were employed (53%) full-time or part-time, followed by students (18,5%) and pensioners (14,3%) (see Figure 14). It is important to notice that the city of Darmstadt is considered a “student city” due to the two universities. In addition, the city of Darmstadt holds industry and offers many job opportunities, not to mention that it is close to the city of Frankfurt and has a good public transport connection for commuters.

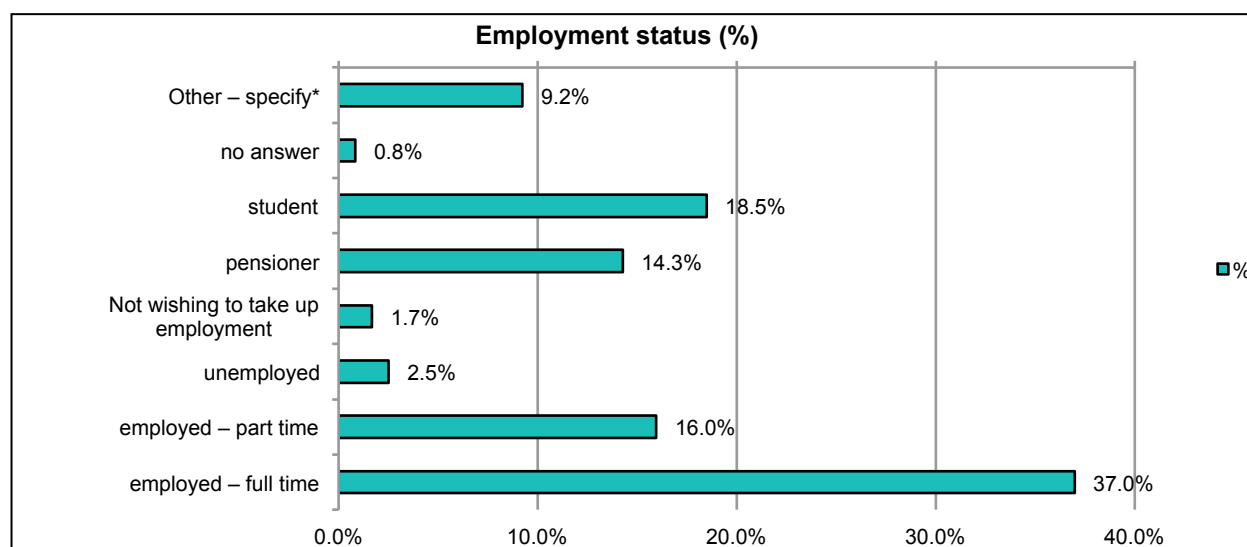


Figure 14: Occupation profile of the sample. Total sample: 119 respondents.

Among those employed only 16,8% were manual workers compared with people working in an office (33,6%) and a large group of people in other forms of employment (self-employed, pupil, seller, public service, carpenter, does not work at all) (see Figure 15).

The majority were day workers (57,1%) with the rest working in shifts (8,4%), very few in night work (2,5%). 32% did not answer.

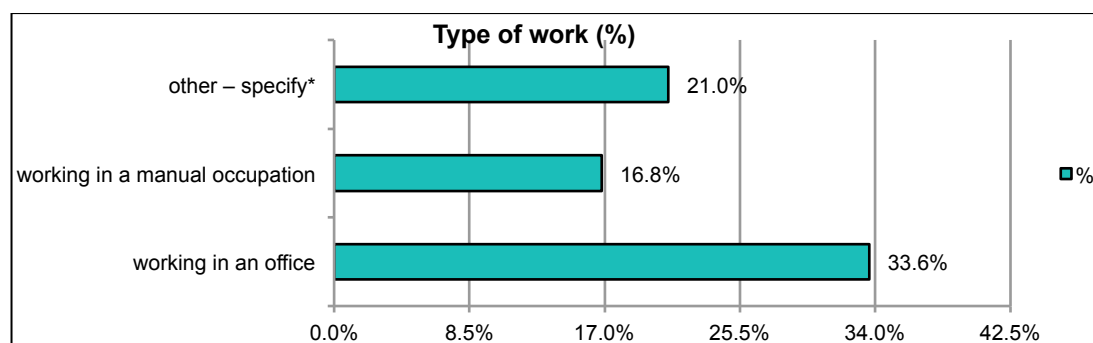


Figure 15: Type of work among those employed. Total sample: 119 respondents (53% employed).

Household situation

The respondents can be split in two groups:

- Those who live alone (29,4%) or with other adults (mostly students sharing a flat) (7,6%).
- Those who live in a family situation: either with a partner with no children (22,7%), with a partner and children (19,3%), or as single parents (5%) or with parents or guardians (11,8%) (see Figure 16 and 17).

Living alone or with a partner without children is a trend in Germany. In another survey made by the city of Darmstadt (sample 710 respondents), around 60% stated that they do not have children (Wissenschaftsstadt Darmstadt, 2016). Persons that answered with living with other adults form a representative group in this survey and it could be assumed that this is due to the high number of students who live in shared flats or simply part of the German culture.

Within the ones who have children, the big majority (53,2%) has only one child up to 6 years old.

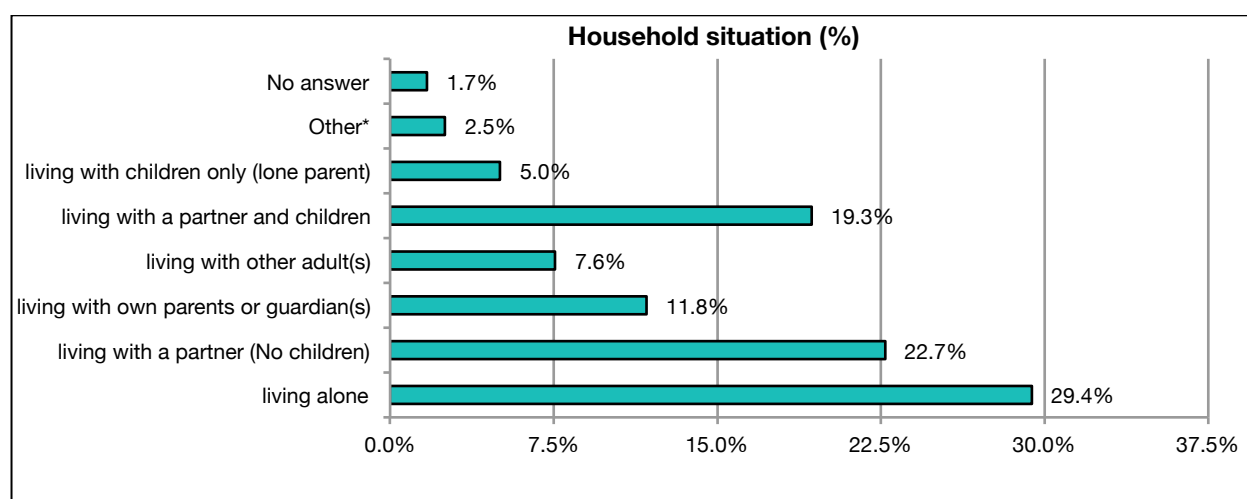


Figure 16: Household situation. Total sample: 119 respondents.

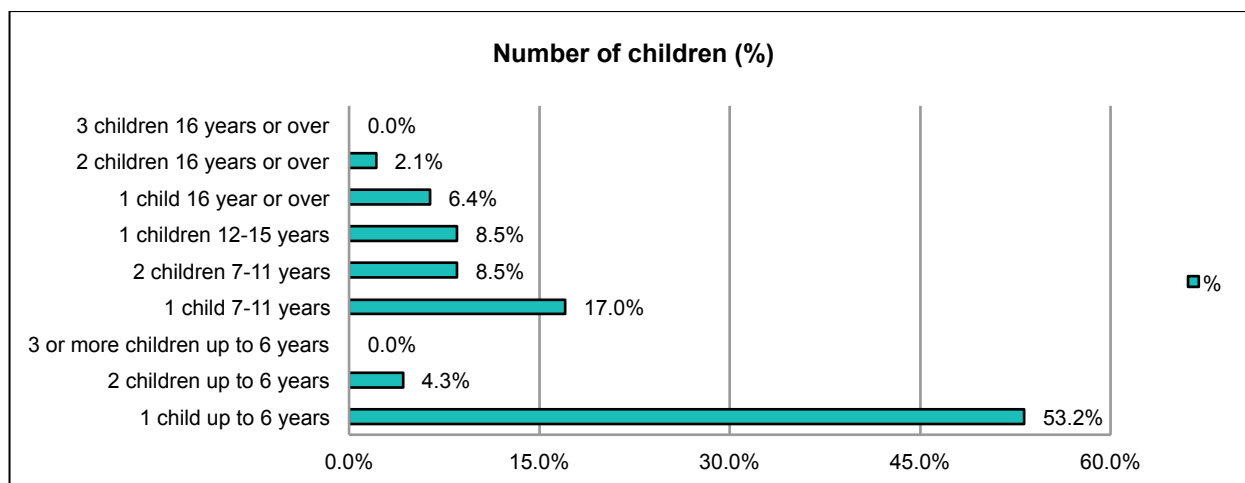


Figure 17: Number of children. Total sample: 119 (24,3% have children).

Housing situation

The majority of respondents (69,7%) lived in blocks of flats, as would be expected given that this is the dominant type of housing in the city of Darmstadt (see Figure 18). The second group consists of people living in detached and semi-detached houses, which are mostly old houses that survived the Second World War or new urban developments in the surroundings of the city.

In addition, around 53% of the respondents have access to a private garden.

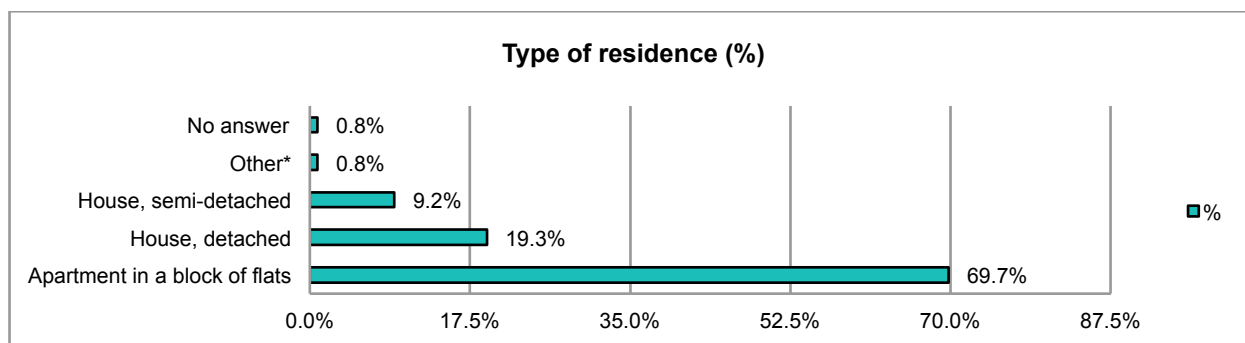


Figure 18: Type of residence. Total sample: 119 respondents.

2.2 Patterns of behaviour/use of urban open space

The citizens of Darmstadt visit not only local open spaces but also non-local spaces that are inside and outside the city. While a big majority of the sample (41,2%) visit open spaces in and outside of Darmstadt, only 13,4% visit local spaces in the neighbourhood (see Figure 19). From these facts it can be asserted that the open space users search for a variety of spaces and those local and non-local open spaces have a good accessibility and connectivity with public transport easy to reach.

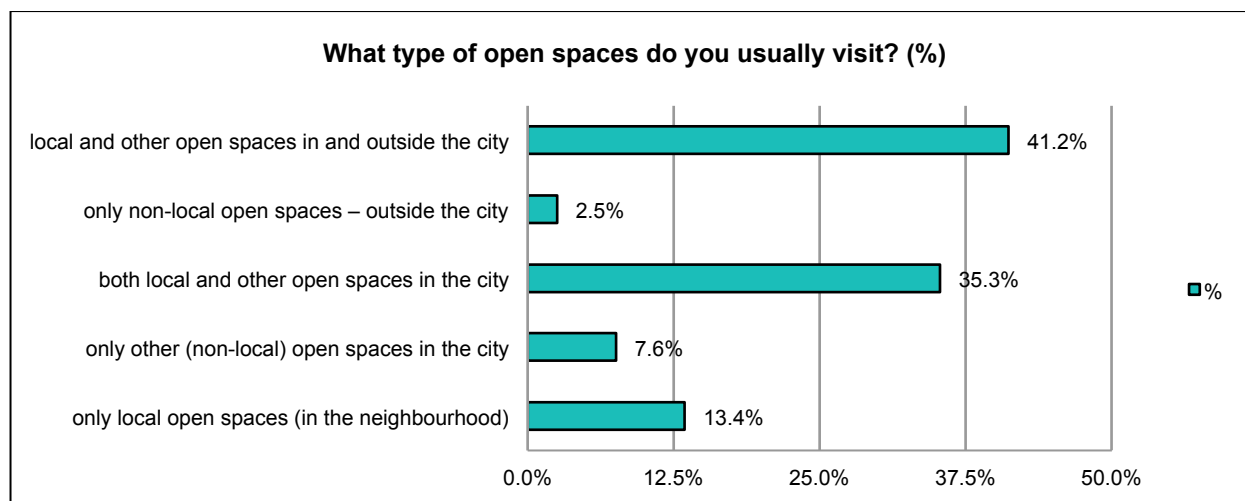


Figure 19: Types of open spaces visited. Total sample: 119 respondents.

Frequency and duration of visits

The open spaces of the city are intensively used. A great part of the respondents answered that they visit the open spaces two or more times per week (44,5%) (see Figure 20) and that the length of the visit lasts more than one hour (45,4%) (see Figure 21). This shows that almost the half of the Darmstadt citizens have an active usage of the space, which goes with the trend of the country. In Germany, 42% of the population exercises or practices sports in an open space (e.g. parks) (EU Commission, 2013).

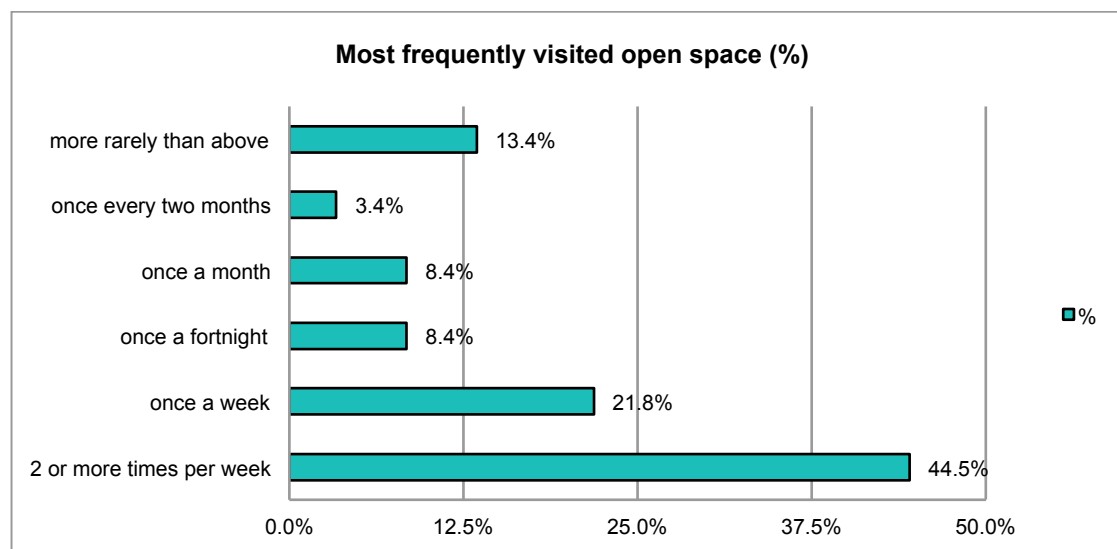


Figure 20: Most frequently visited open space. Total sample: 119 respondents.

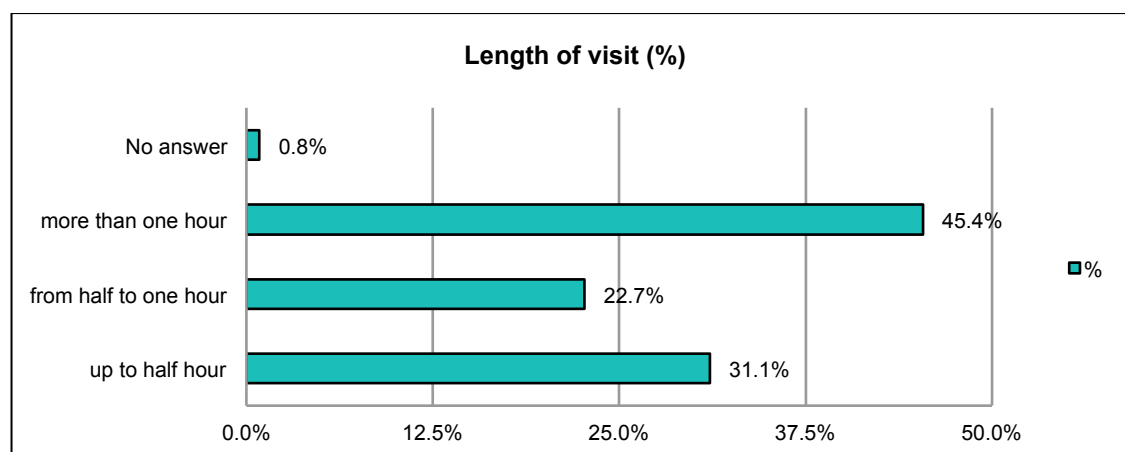


Figure 21: Length of the visit of open spaces. Total sample: 119 respondents.

Activities during the visit

The visitors of the open public spaces perform different activities during their stay at the open space: rest is on the first place, with a 38,7% of respondents; walk or jog around or through the open space (36,1%) and meet with other people or socialize (36,1%) are on the second place; and on the third place, to observe the nature, with a 23,5% (see Figure 22).

The activities that are less performed by the visitors in the open space are: cycle through the space and practice a sport. It can be assumed that these activities are less performed due to the lack of availability of facilities to cycle or to practice a sport, or in the case of the cyclists, that the interviewers did not catch them to fill the survey.

Other activities that are performed on the open spaces are: wait for someone, let the time pass, wait for the bus/train, smoke, read, and have a coffee break.

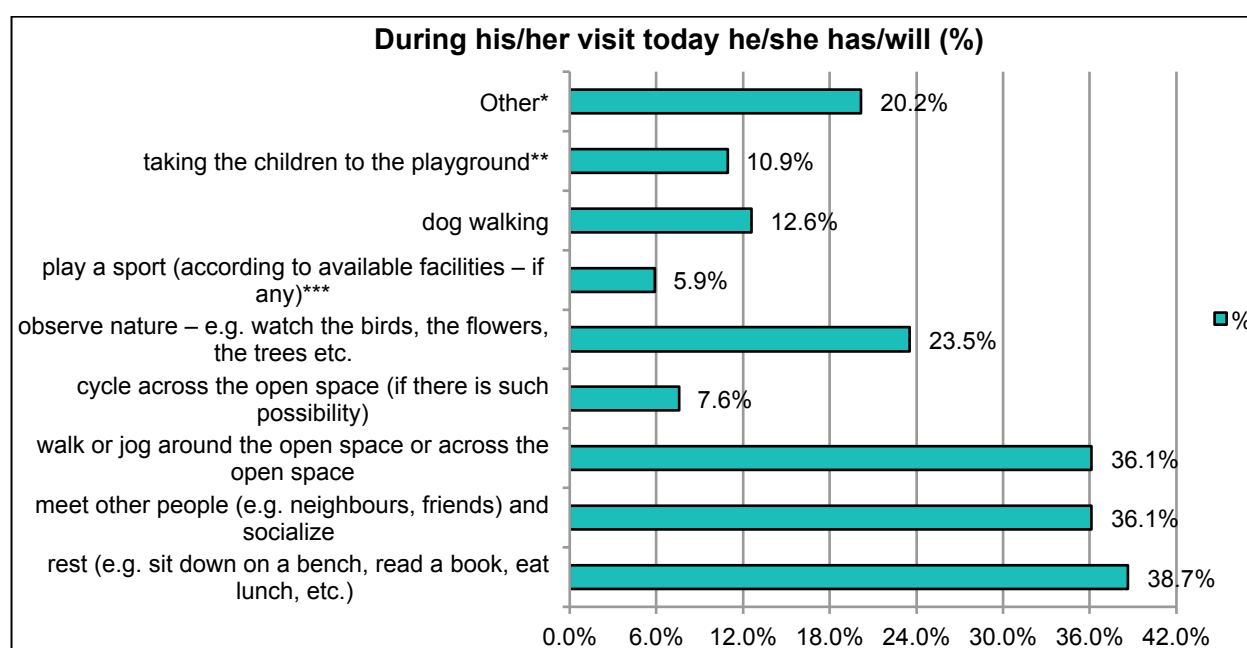


Figure 22: Activities during the visit of the open space. Total sample: 119 respondents.

Most of the activities that require physical movement (e.g. walk, jog, cycle across the space) are often practiced in the mornings, while activities that are related to rest and relax are performed mostly in the afternoon.

Company during visits

Less than 60% of the users of the open public spaces are accompanied by other adults (39,5%) or by children (20,2%). More than one third of the users come alone (35,3%) (see Figure 23). Other companions are dogs or professional nurses. The children who accompany the visitors to the open space are generally less than 6 years old. This can be assumed because children who are less than 6 years old are not independent and need an adult to visit the open spaces.

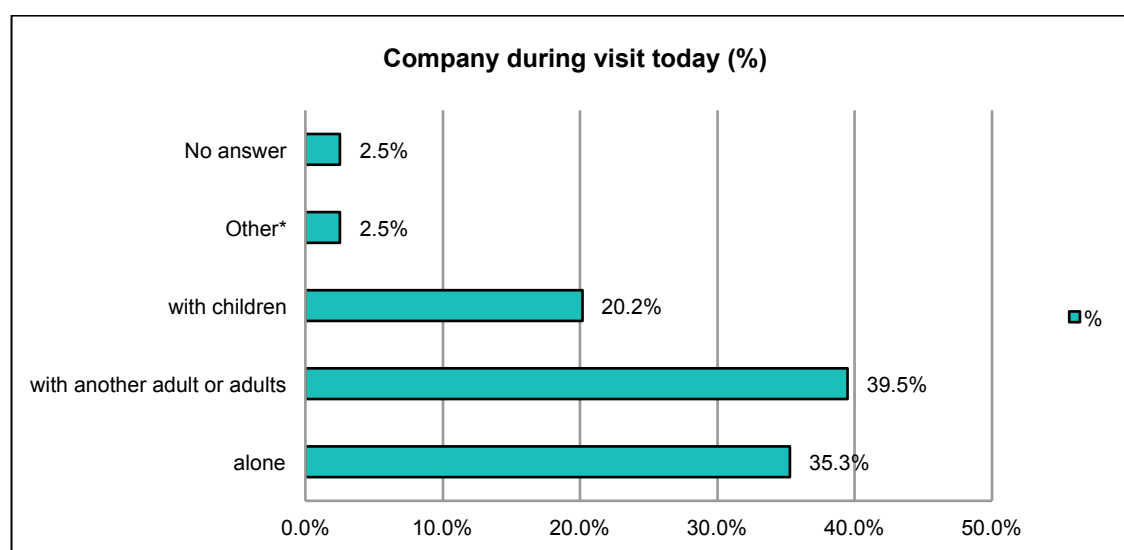


Figure 23: Company during the visit of the space. Total sample: 119 respondents.

Access to open spaces

The majority of the visitors (40,3%) travel more than one kilometre or 20 minutes by foot. Still, the most common way to visit the open spaces is on foot (52,1%). The second mode of transport to visit the open spaces is the bicycle (19,3%) (see Figure 24 and 25).

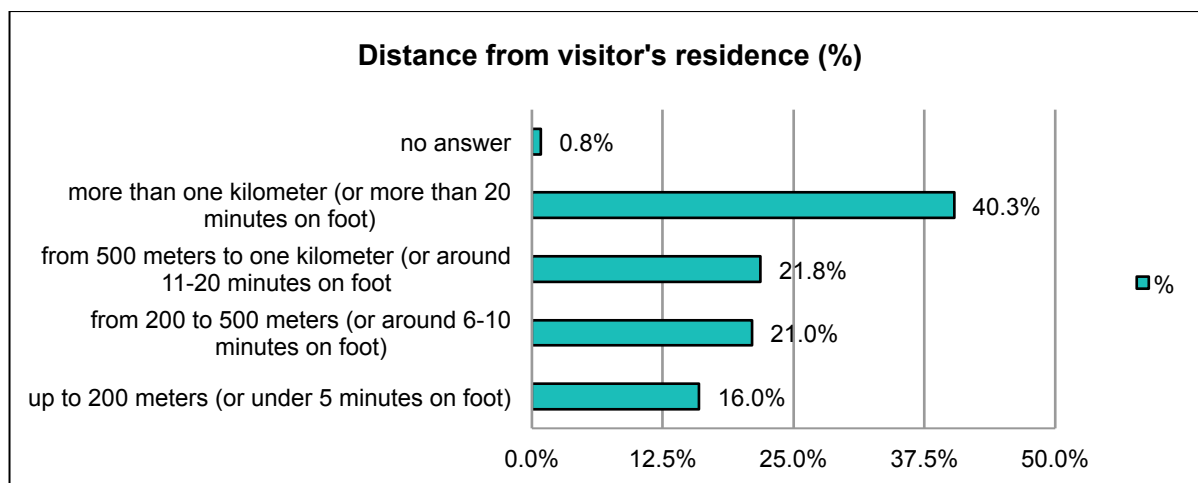


Figure 24: Distance of the open space from visitor's residence. Total sample: 119 respondents.

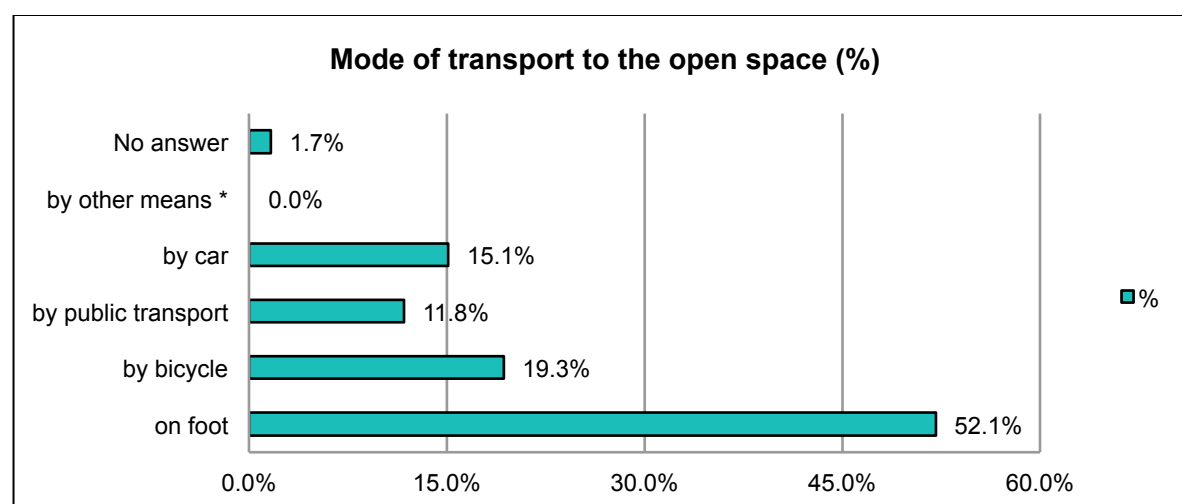


Figure 25: Mode of transport to the open space. Total sample: 119 respondents.

2.3 Benefits and improvements

Improvements

The users of the open public spaces in the city of Darmstadt shared the desirable improvements and the perceived benefits of the space. The desirable activities that the citizens would like to perform in the open space (if the infrastructure was provided) range from: walk or jog across the space (49,6%), swimming (32,8%), cycle across the space (21,8%), exercise in an open-air gym (18,5%), among others. Within the category of “Other sports” the respondents answered: skiing, table tennis, Pilates, yoga, Frisbee, sports route / parkour. Within the category “Other activity” the respondents answered: space to let the dogs run freely / take the dog with us, just to pass, playground, bridle path, relax and enjoy nature, and drink coffee (see Figure 26). It is important to notice that this question was multiple choice and the percentages may exceed 100.

It is interesting to notice that the respondents would like to walk or jog across the space, when the infrastructure is already provided. On the other hand, it is clear that swimming is a desirable activity

considering that the city only offers three swimming pools, which are often overcrowded and some of them are expensive.

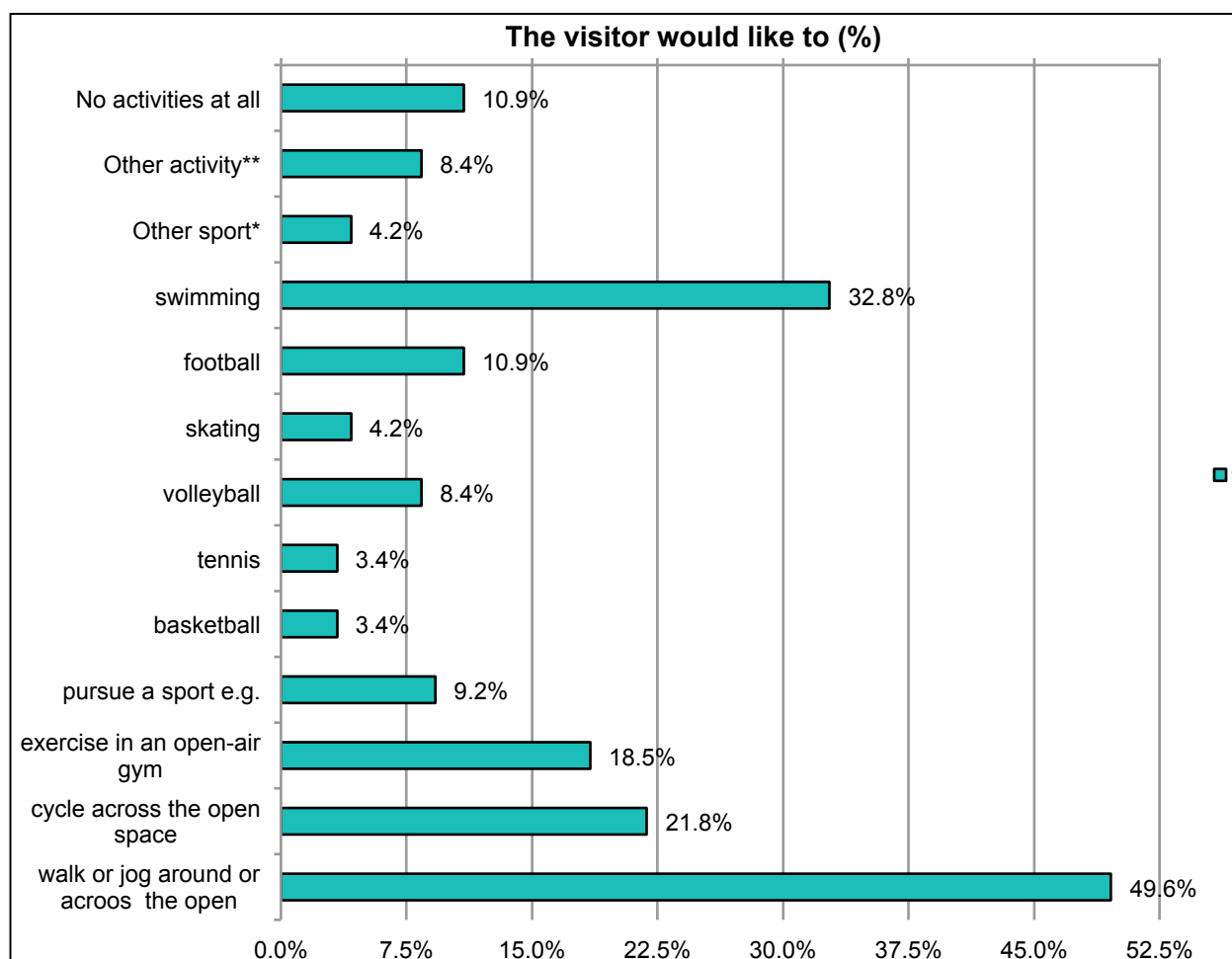


Figure 26: Desired activities by the visitors (multiple choice questions – total answers exceed 100%). Total sample: 119.

In addition, the users expressed what kind of improvement they would like to see in the open spaces. The improvements encompass on the first place, free drinking water; on the second place, benches or other urban furniture; on the third place, improve cleanliness (see Figure 27). Other improvements which are desirable are: better upkeep of footpaths and other areas used by the visitors, free Wi-Fi access, better design, improve vegetation, improve safety (more and better lighting), bicycle parking, and noise control, among others.

Within the category “Other improvements”, the answers vary as follows: a more closed area, parking area, permission to bring dogs to the area, more money to support the sport club, opening hours of the ruin, no cars, flat routes / plain ground, signage posting, improve cycle paths, less garden maintenance for more insects, poor condition of seats, water, coffee, improvement of the quality of air / exhaust gases.

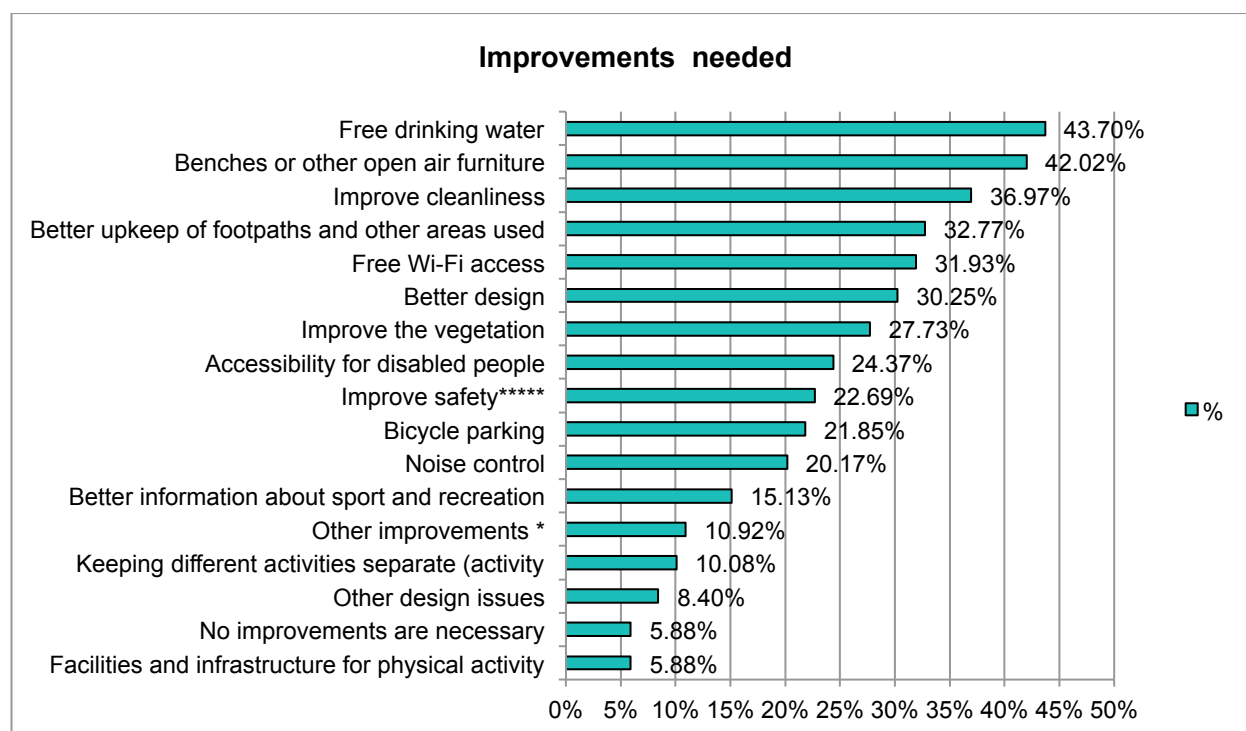


Figure 27: Desired improvements on the open spaces (multiple choice questions – total answers exceed 100%) Total sample: 119 respondents.

Despite the plenty amount of desirable improvements on the open space, the citizens expressed that they are satisfied (46,2%) or partly satisfied (35,3%) with the open spaces (see Figure 28).

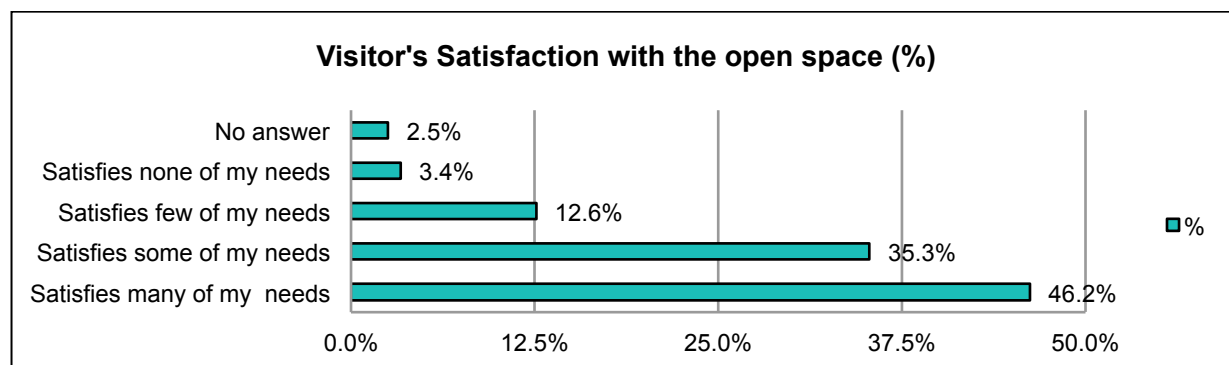


Figure 28: Visitor's satisfaction with the open space. Total sample: 119 respondents.

Perceived Benefits

The visitors report perceived benefits from the activities they pursue in open spaces. In a scale from 1(very low) to 5 (very high) the respondents answered:

Low – very low – medium: I take up a sport I like, my kids can play, improves my family's health, I keep fit. These percentages could be assumed due to the low sample of people with children, or the unavailability of opportunities to practice sport in the open space.

Very high or high: I rest and relax, I meet other people and socialize, improves my health and I enjoy the nature (see Figure 29).

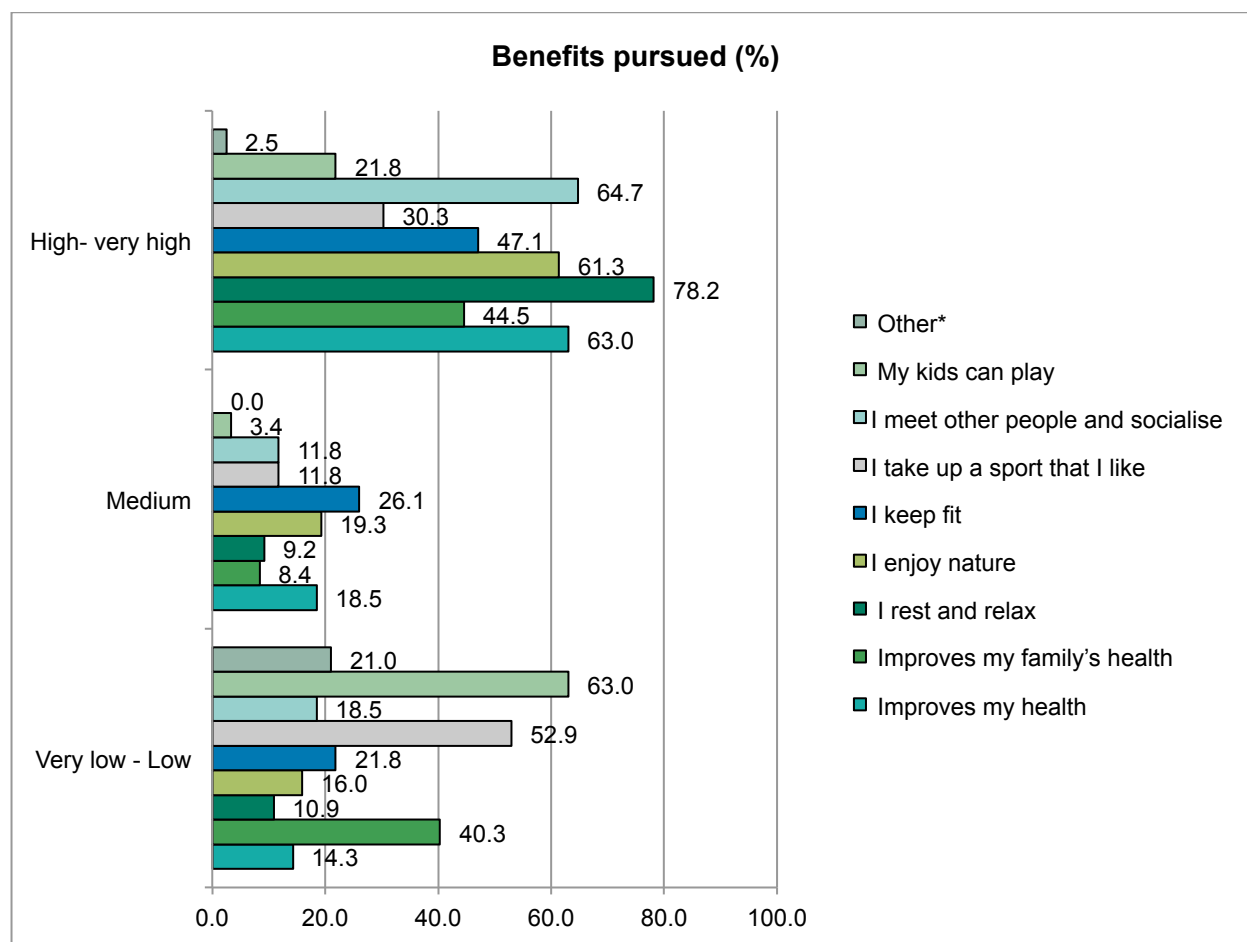


Figure 29: Perceived benefits in % from visiting open spaces divided in 3 categories: high or very high, medium or low – very low. Total sample: 119 respondents, 492 answers.

2.4 Lifestyle of users

Almost half of the respondents spend between 2 and 6 hours per day sitting, and around 35% spend between 7 and 12 hours (see Figure 30). This fact reflects the sedentary lifestyle of the citizens, where the majority is employed full-time and in sedentary jobs (offices).

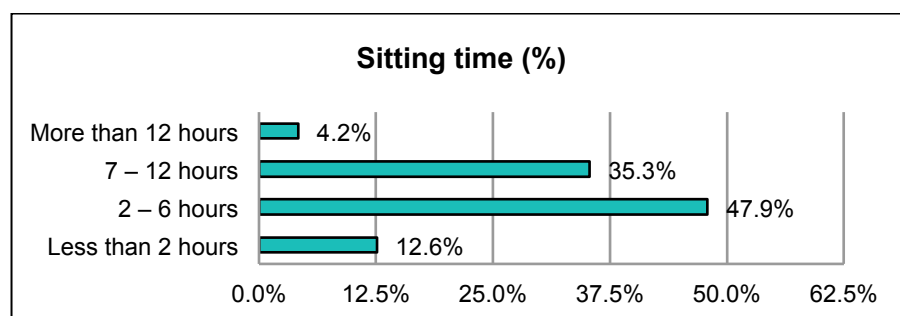


Figure 30: Percentage of sitting time of the visitors. Total sample: 119 respondents.

Around 90% of the users of the open spaces enjoy having more than 2 hours of free time. Only 6,7% of the respondents have less than 2 hours of free time (see Figure 31).

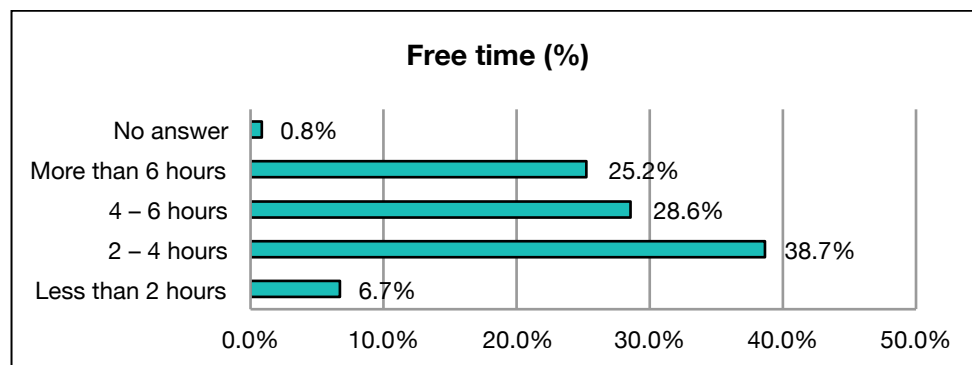


Figure 31: Percentage of free time of the visitors of the open space. Total sample: 119 respondents

The level of stress among the respondents vary from some stress (33,1%), much stress (25,4%), little stress (23,7%), no stress at all (11,9%) to very much stress (5,9%), and no answer (0,8%) (see Figure 32).

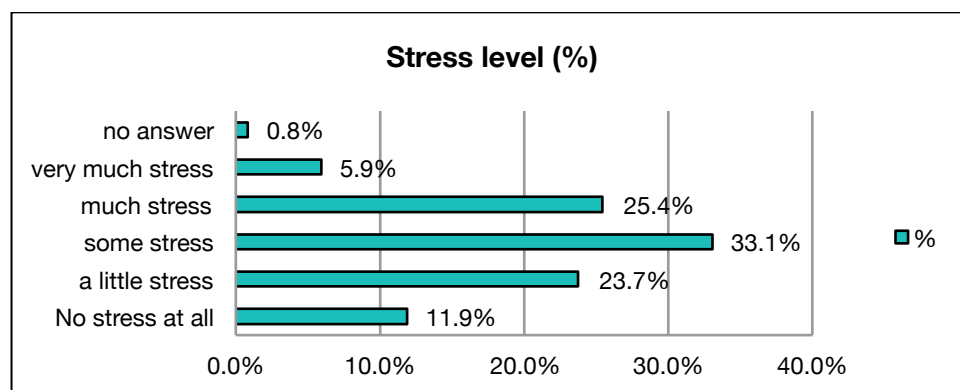


Figure 32: Stress level of the visitors in general. Total sample: 119 respondents.

Physical Activity

Respondents were asked to report about any physical activity they may have undertaken during the past month from a list of 12 indoor and outdoor activity options.

All respondents report having undertaken one or more activities -mostly outdoors- and included other activities that are not in the list. Cycling was reported by a majority of 32,3%, followed by swimming (28,9%), jogging/running (24,9%), walking (24,4%), gym (19,4%), football (14,9%), other activity (not specified - 10%), other sport (badminton, physiotherapy, boxing, bouldering, climbing, sport student, stand up paddling, Pilates, yoga, surfing, bungee, horse riding, handball - 7,5%), basketball, skating or tennis (7%) and no activity (3%).

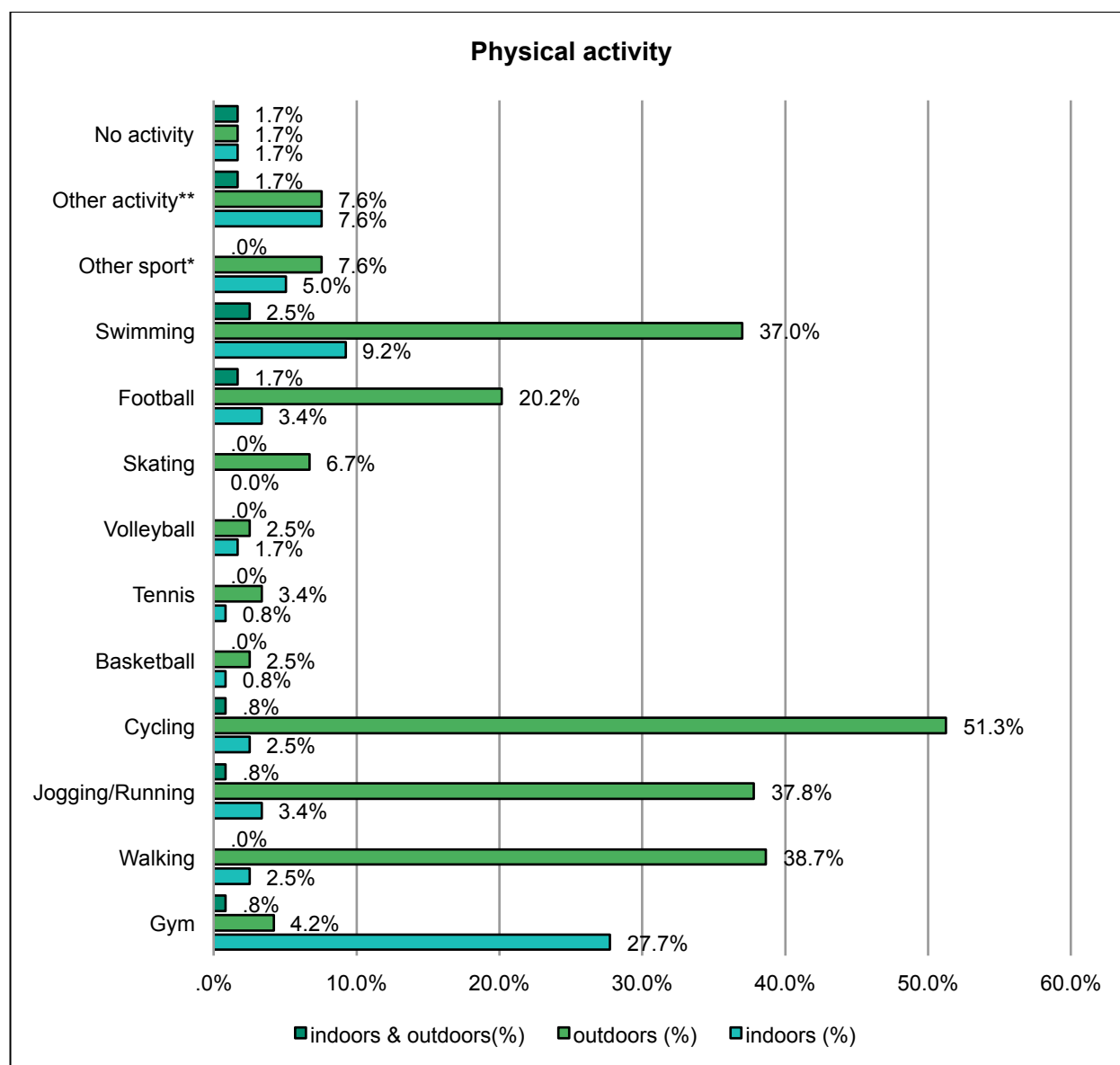


Figure 33: Physical activity performed on the last month. Total sample: 119 respondents

Digital technology

The large majority (83,1%) of the respondents use mobile internet, and from this percentage, 57,4% use social media apps outdoors (e.g. Facebook). 18,2% use other digital media (email, read the paper, weather app, Google Maps, navigation apps in general, notebook, Netflix, Deutsche Bahn App, Spotify - Music, YouTube, E-book, calendar), 16,2% use urban or location-based games, and 8,1% use fitness apps.

Therefore, there is a great potential to develop a location-based game that enhances physical activity among the German population.

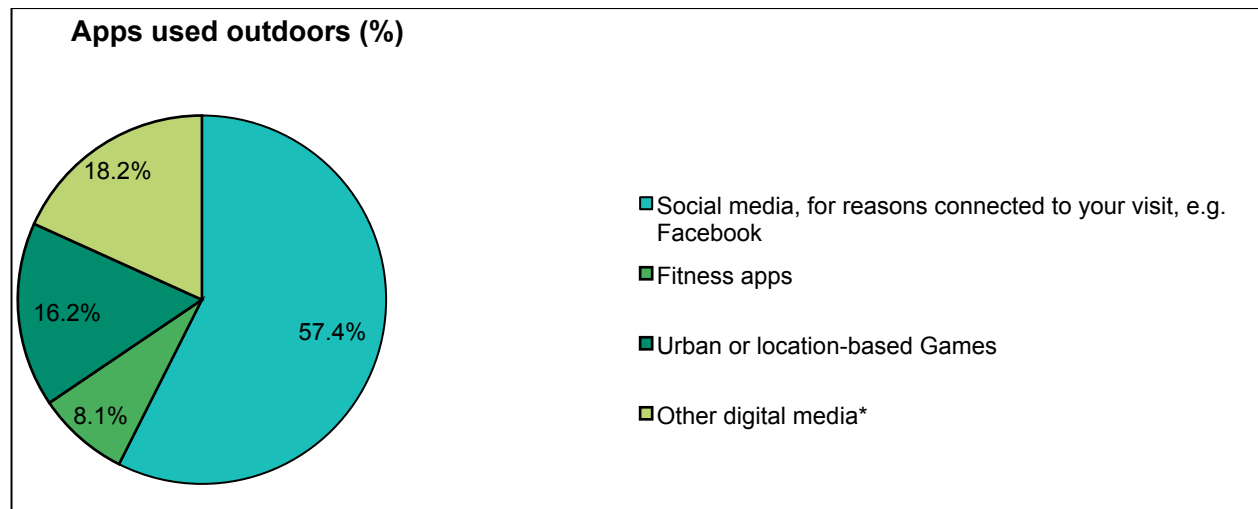


Figure 34: Apps used outdoors. Total sample: 119 respondents.

3. What influences the open space users' behaviour?

This section explores the influence that the respondents' profiles may or may not have on the users' patterns of behaviour when using open spaces.

This is done through a cross tabulation analysis of the survey results between the users' demographic and socio-economic variables and the variables denoting their patterns of behaviour and use of public spaces and their perceived benefits and improvements.

The size of the survey sample and more importantly the small size of the sample for certain combinations of variables does not allow for robust tests of significance and therefore the analysis is limited to the identification of trends and working hypotheses.

The next correlation table shows significant correlations at an average level (*) and at a significant level (**) of all the dependent and independent variables. The blank cells show no correlation at all. The subdivision of the variable 7 was not considered due to the small sample size.

Table 1: Correlations between the user behaviour in open spaces (dependent variables) and the demographic and socio-economic characteristics (independent variables).

Demographic and socio-economic characteristics	User behaviour in open spaces								
	V1 - Sex	V2 - Age	V3 – Education level	V4 - Are you...	V5 - Are you working in	V6 - Are you working	V7 - Household situation	V9 - Type of residence	V10 - Access to private garden
V11 - What type of open spaces do you usually visit									-,186*
V12 - How often have you visited this open space (on average) over the past 6 months?					,214*				-,243**
V13 - How long is your visit to this open space (on average)									
V14 - During his/her visit she/he - rest (e.g. sit down on a bench, read a book, eat lunch, etc.)									
V14 - During his/her visit she/he - meet other people (e.g. neighbours, friends) and socialize		-,274**	-,214*		,272*				
V14 - During his/her visit she/he - walk or jog around the open space or across the open space							-,256**	-,242**	
V14 - During his/her visit she/he - cycle across the open space (if there is such possibility)							,290**		
V14 - During his/her visit she/he - observe nature – e.g. watch the birds, the flowers, the trees etc.		,406**							
V14 - During his/her visit she/he - play a sport (according to available facilities – if any)									-,232*
V14 - During his/her visit she/he - dog walking									
V14 - During his/her visit she/he - taking the children			,251**	-,239**			,392**		

to the playground									
V14 - During his/her visit she/he - Other			,212*						
V15 - Are you today visiting the open space alone or accompanied		-,219*							

3.1 Patterns of user behaviour

Type of open spaces usually visited

Trends indicating impact on patterns of users' behaviour are found only for the variable "access to private garden".

Access to private garden

As stated on table 1, there is a correlation at an average level between type of open space visited and access to private garden. The graphic below shows that people who have access to a private garden tend to visit more open spaces inside and outside the city than the ones who do not have access. People who do not have access to a private garden tend to visit more open spaces inside the city than the people who have access to a private garden (see Figure 35).

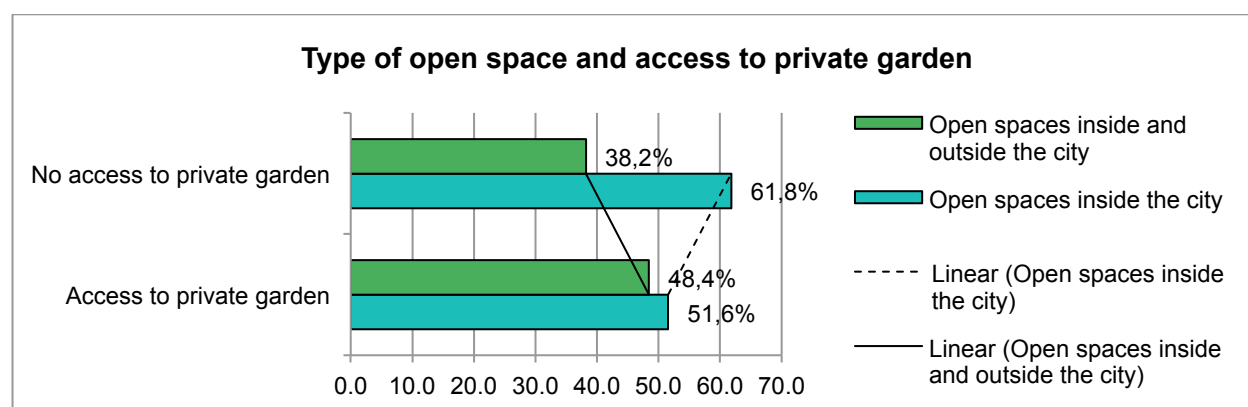


Figure 35: Type of open space visited and access to private garden. Total sample: 119 respondents (64 have access to private garden).

Frequency of Visits

Trends indicating impact on the frequency of visits are found for type of occupation and access to private garden.

Type of occupation

There is a marked trend: the ones who work in an office tend to visit more often the open spaces, followed by the ones working in a manual occupation and by other types of occupation.

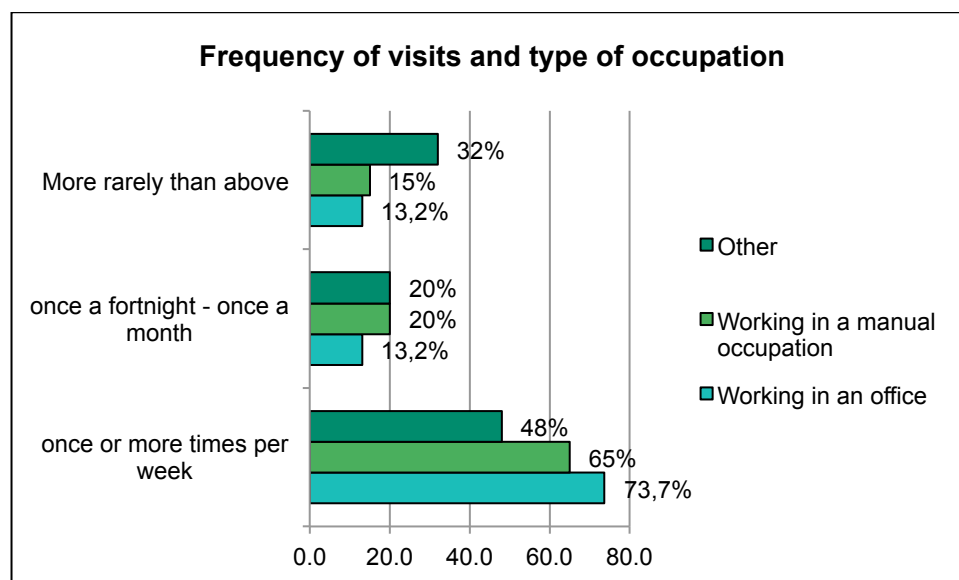


Figure 36: Frequency of visits and type of occupation. Total sample: 119 respondents (38 are working in an office, 20 in manual occupation and 25 in other types of occupation).

Access to private garden

People who have no access to a private garden visit open public spaces more frequently than people who have access to a private garden, and the ones who have access to a private garden have higher rates of visiting rarely open spaces than the ones who do not have access (see Figure 44).

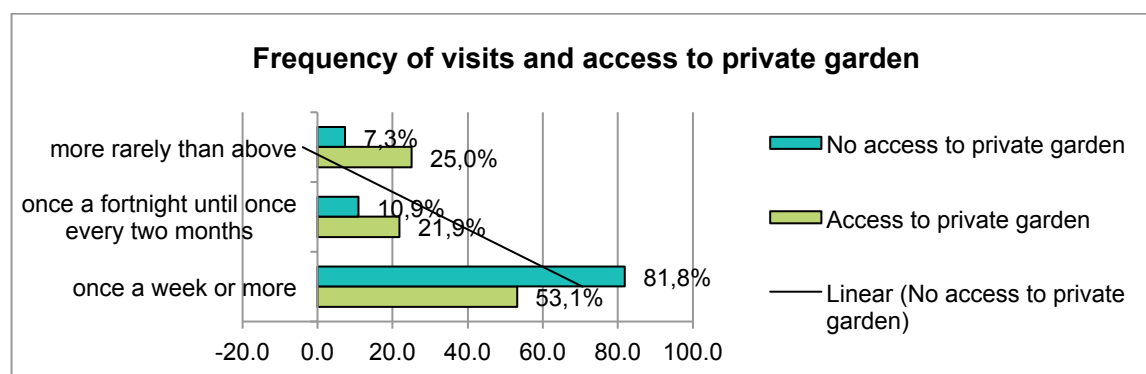


Figure 37: Frequency of visits by access to private garden. Total sample: 119 respondents (64 have access to private garden).

Activities undertaken

Trends indicating impact on the activities undertaken on the open spaces (meet other people and socialize, walk or jog around the space, cycle across the space, observe the nature, play a sport and take the children to the playground) are found for different independent variables as follows.

Meet other people and socialize in open spaces

The activity “meet other people and socialize” is impacted by variables as: age, education level, type of employment and number of children, although this last variable cannot be considered due to the low sample within this category.

Regarding age group, the younger people tend to socialize more, followed by the advanced adults and elderly. The group that less socializes in open public spaces is the adults (26-45 years old) (see Figure 38).

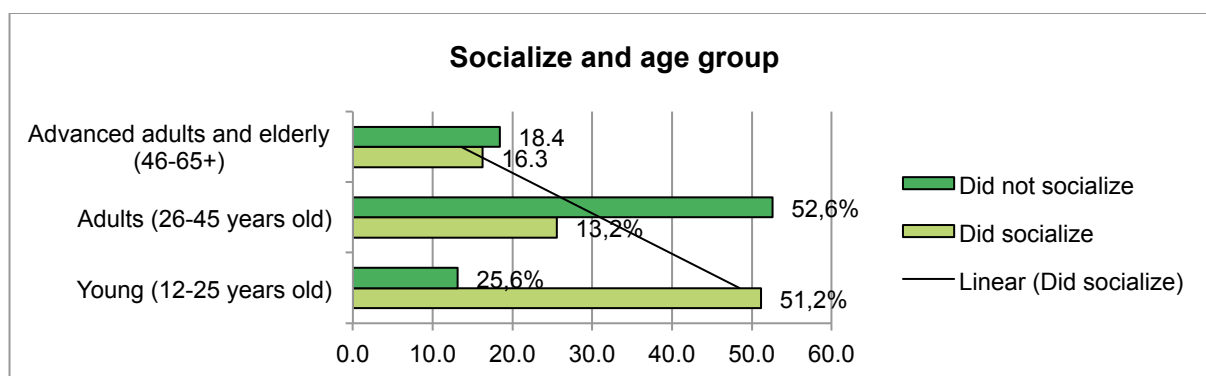


Figure 38: Socialize and meet other people by age group. Sample 119 respondents (43 respondents did socialize in the open space).

The relationship between education level and the activity meet other people and socialize shows an inverse correlation, the higher the education level, the less socialization (see Figure 39).

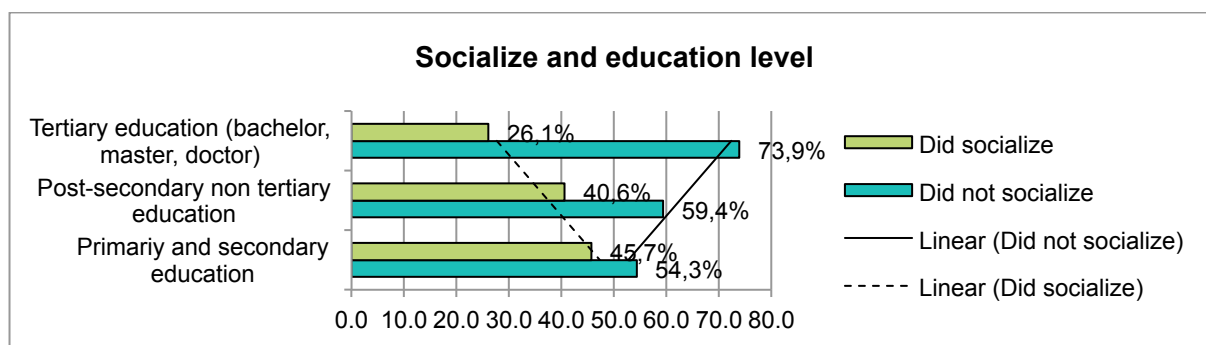


Figure 39: Meet other people and socialize by education level. Total sample: 119 respondents (43 respondents did socialize in the open space).

In addition, the ones who work in an office tend to socialize less than the ones who work in manual occupation or other types of work (see Figure 40).

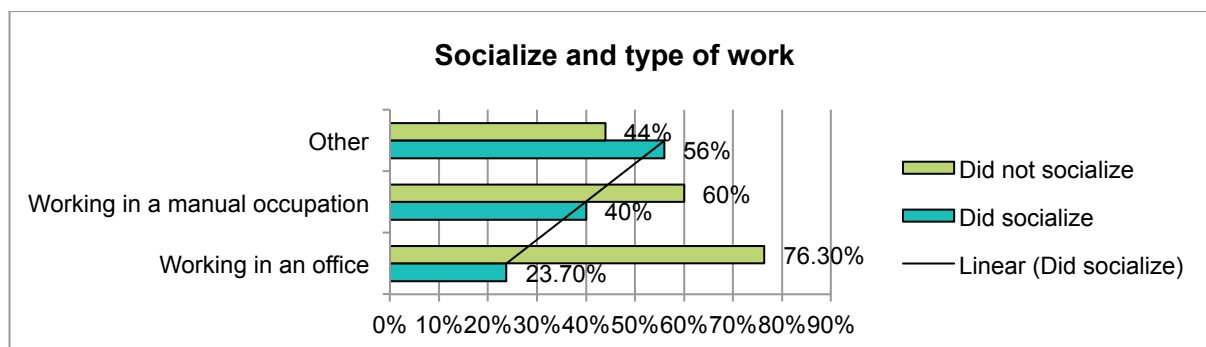


Figure 40: Socialize and type of work. Total sample: 119 respondents (43 respondents did socialize in the open space).

Walk or jog around/across the open space

The activity “walk or jog around/across the open space” is impacted by two variables: household situation and type of residence.

There is a clear tendency between household situation and walk or jog across the space: the people, who live alone, tend to walk or jog more than the ones who live with children (see Figure 41). This could be assumed because of the lack of free time that parents have.

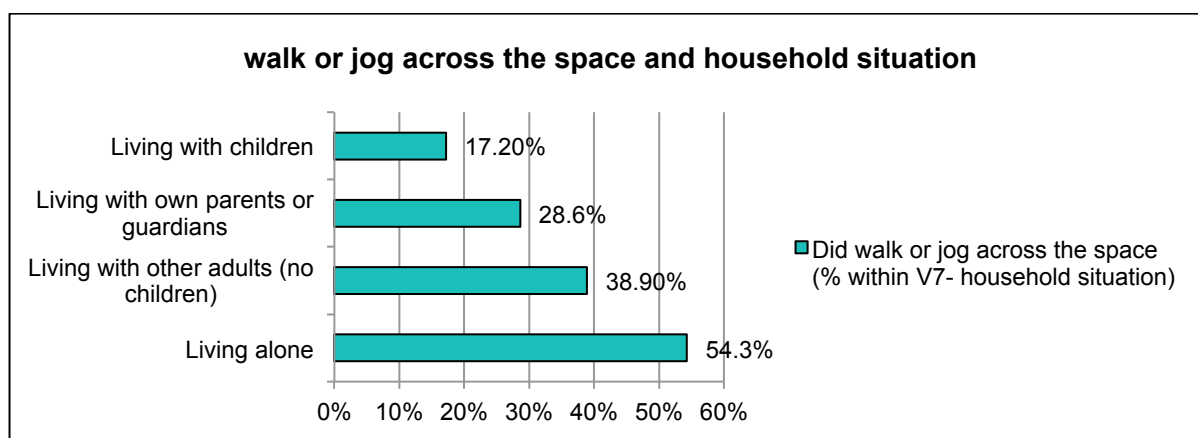


Figure 41: Walk or jog across the space and household situation. Total sample: 119 respondents (43 respondents did walk or jog across the open space).

In addition, the people who live in apartments in block or flats tend to walk or jog in open spaces more than the ones who live in detached or semi-detached houses (see Figure 42).

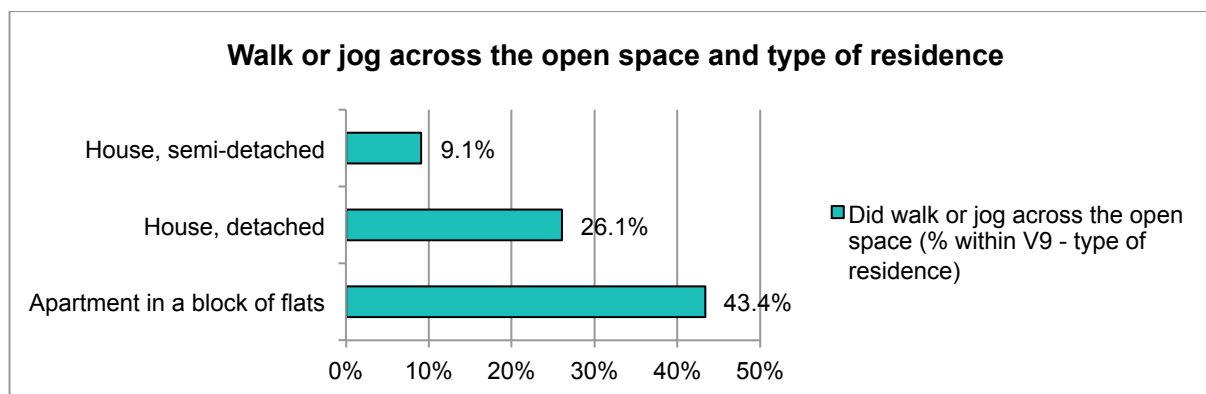


Figure 42: Walk or jog across the space and type of residence. Total sample: 119 respondents (43 respondents did walk or jog across the open space).

Cycle across the open space

Even though the sample for cyclists across the open spaces was small and it cannot be considered as a correlation (only 9 cyclists of 119), a trend regarding the household situation is noticeable. The parents with children seem to bicycle more than the ones living alone (see Figure 43). Active travel (walking and cycling for traveling purposes) is a trend that is slowly increasing in Germany, especially among young parents with children. In addition, the city of Darmstadt is a compact city suitable for cycling and a fast mode of transport.

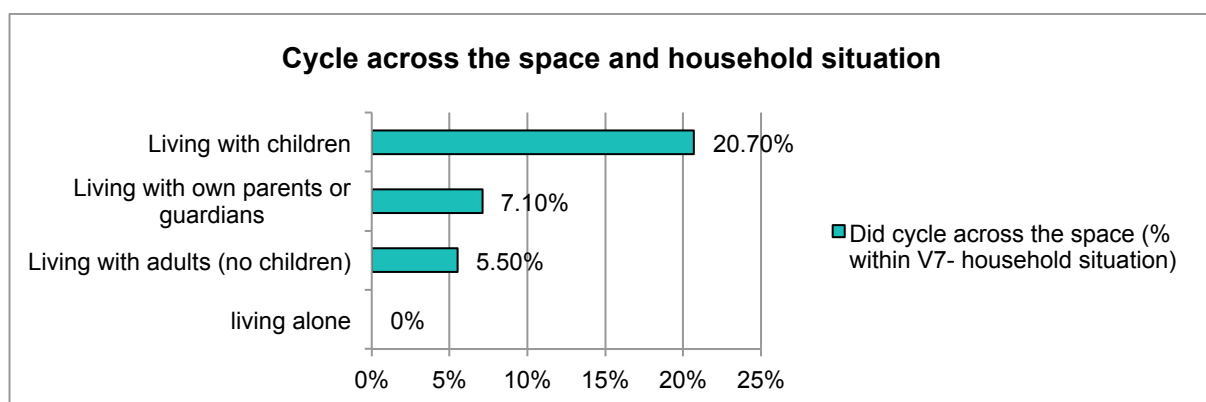


Figure 43: Cycle across the open space and household situation. Total sample: 119 respondents (9 did cycle across the open space).

Observe the nature

There is a linear correlation between the activity observe the nature and age group. With the increase of age, people tend to observe nature in open spaces even more (see Figure 44).

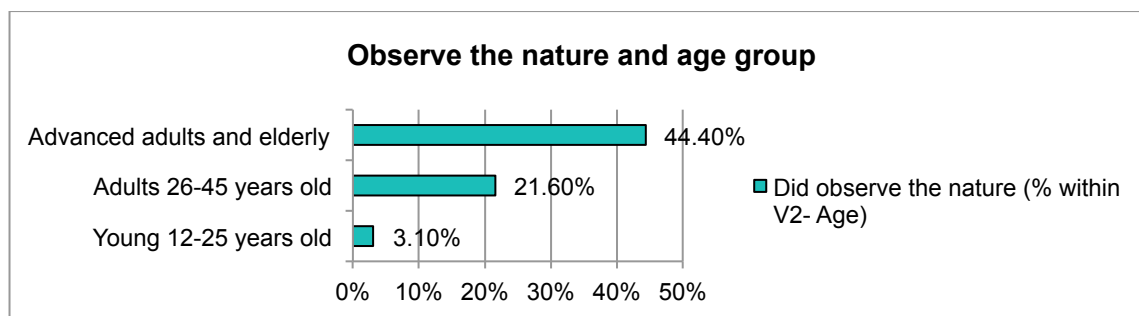


Figure 44: Observe the nature and age group. Total sample: 119 respondents (28 respondents observed the nature in open spaces).

Take the children to the playground

Within the persons who perform the activity “take the children to the playground” (13 respondents), the majority (almost 70%) had a high level of education (see Figure 45). In addition, the big majority was employed (92%) (see Figure 46).

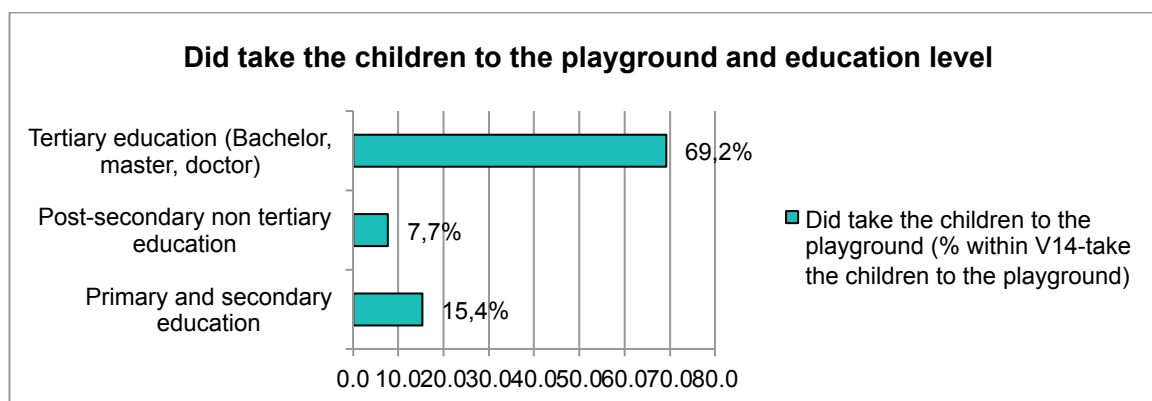


Figure 45: Take the children to the playground by education level. Total sample: 119 respondents (13 took the children to the playground).

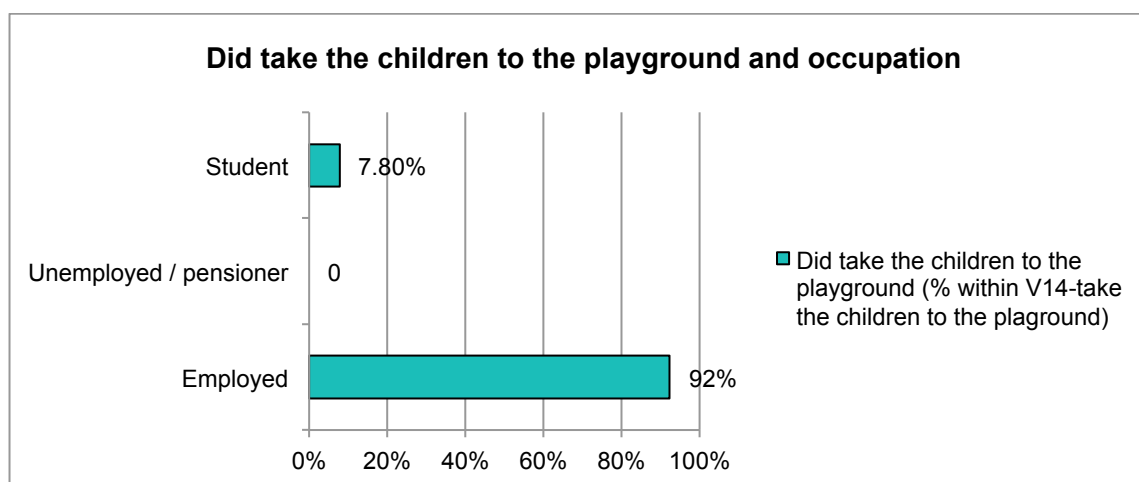


Figure 46: Take the children to the playground by occupation. Total sample: 119 respondents (13 took the children to the playground)

Company during the visit

Trends indicating impact are found only for age and household situation.

Age

There is no specific trend for the young people, since many did not answer this question. The pattern for the adults is to visit the open space alone. The trend for the advanced adults and elderly is divided: around the half visit the space alone and the other half with other adults (see Figure 47).

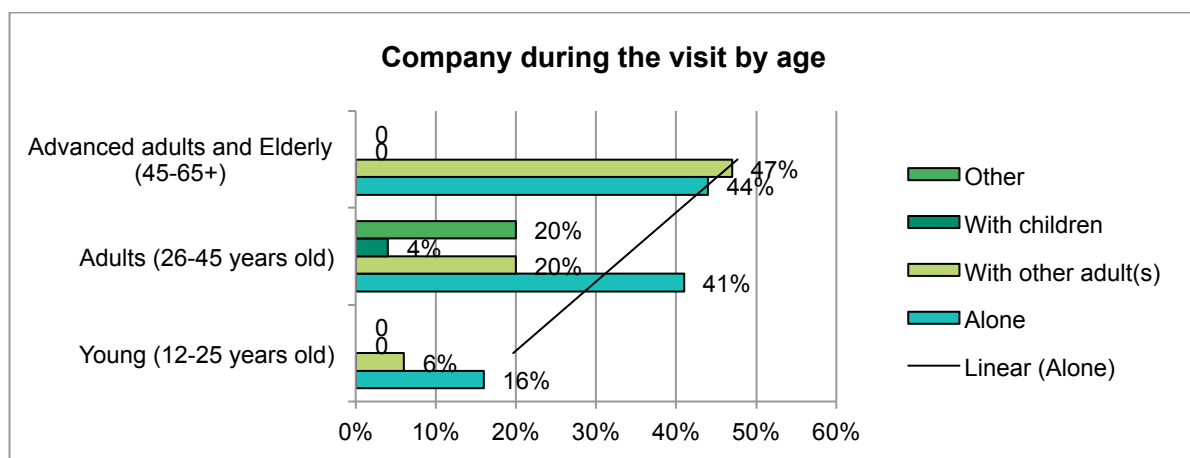


Figure 47: Company during the visit by age. Total sample: 119 respondents

Report of the online survey in Darmstadt

1. Introduction

In Germany, the online survey took place on the platform Google and was spread through the website of the city of Darmstadt and personal contacts.

The total sample was of 51 respondents, which does not allow giving robust conclusions but an impression of the behaviour of the open spaces in Germany.

2. The open space users

This section presents, through a frequency analysis of the survey results, the demographic and socio-economic profile of the users of open spaces who answered the survey, their patterns of behaviour, perceived benefits and improvements, and aspects of their life style.

2.1 User profile

Gender

Respondents included men and women, being women the majority (37,3% and 62,7% respectively).

Age

Respondents did not cover the whole range of ages, missing young people (12-17 years old) and adults (56-65 years old). The big majority of respondents were between 26-35 years range, which is coherent since the survey was popularized mostly with university students (see Figure 1).

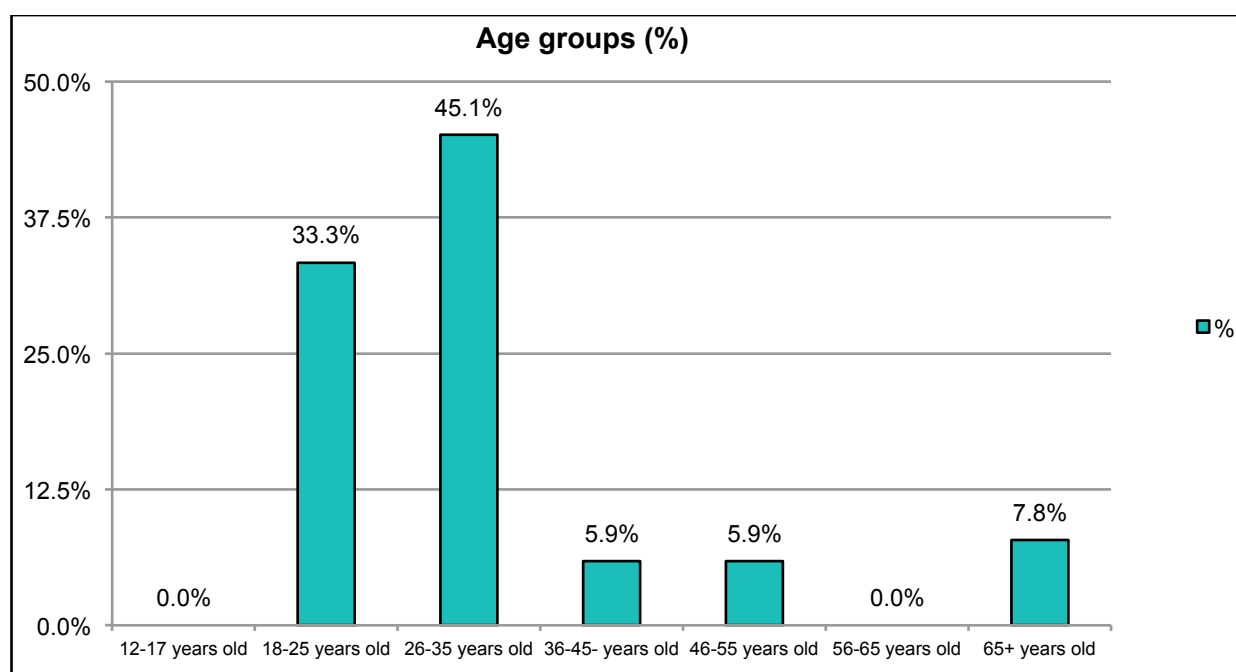


Figure 48: Age profile of the sample: Total sample: 51 respondents.

Education

Respondents did not cover the whole range of education levels. The representatives with primary education levels are missing, while the large majority, around 85%, has tertiary education levels (bachelor, master or doctoral) (see Figure 2).

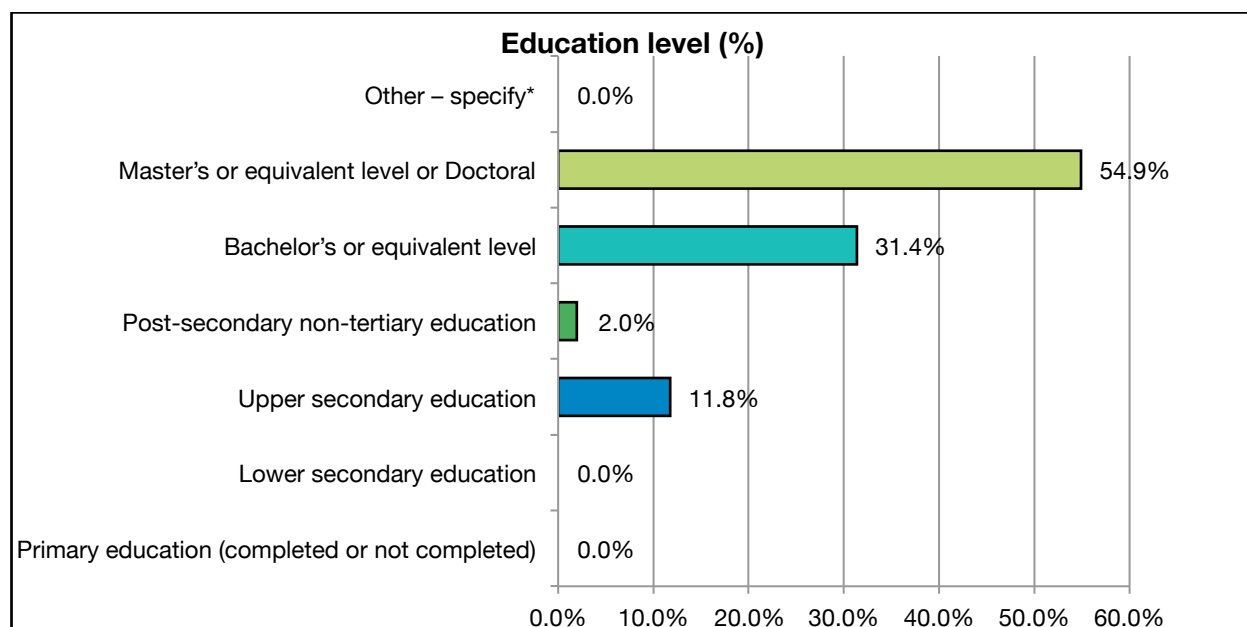


Figure 49: Education profile of the sample. Total sample: 51 respondents.

Employment

Among respondents around the half were employed (49%) full-time or part-time, followed by students (45,1%) and the pensioners (5,9%) (see Figure 3). It is important to notice that the city of Darmstadt is considered a “student city” due to the two universities. In addition, the city of Darmstadt holds industry and offers many job opportunities, not to mention that it is close to the city of Frankfurt and has a good public transport connection for commuters.

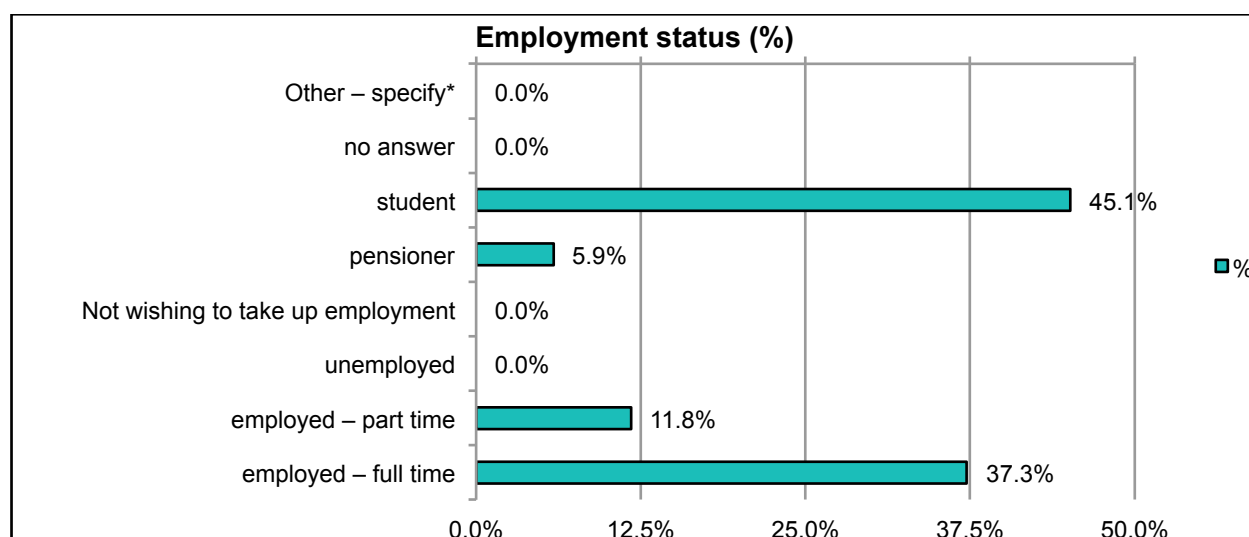


Figure 50: Occupation profile of the sample. Total sample: 119 respondents.

Among those employed, none of them are manual workers while the majority are working in an office (62,7%) and a small group of people categorized itself as “other” (bookstore, hospital) (see Figure 4).

The majority were day workers (68,6%) with the rest working in shifts (2%) and no answer (29,4%).

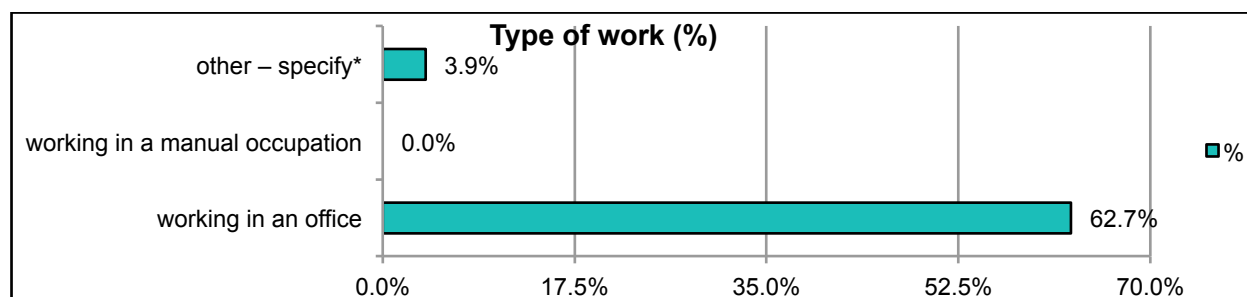


Figure 51: Type of work among those employed. Total sample: 51 respondents (49% employed).

Household situation

The respondents can be split in two groups:

- Those who live alone (27,5%) or with other adults (mostly students sharing a flat) (21,6%).
- Those who live in a family situation: either with a partner with no children (47,1%), with a partner and children (2%), or with parents or guardians (2%) (see Figure 5).

Living alone or with a partner without children is a trend in Germany. In another survey made by the city of Darmstadt (sample 710 respondents), around 60% stated that they do not have children (Wissenschaftsstadt Darmstadt, 2016). Persons that answered with living with other adults form a representative group in this survey and it could be assumed that this is due to the high amount of students who live in shared flats or simply part of the German culture.

Within the ones who have children, the big majority has only one child up to 6 years old (see Figure 6).

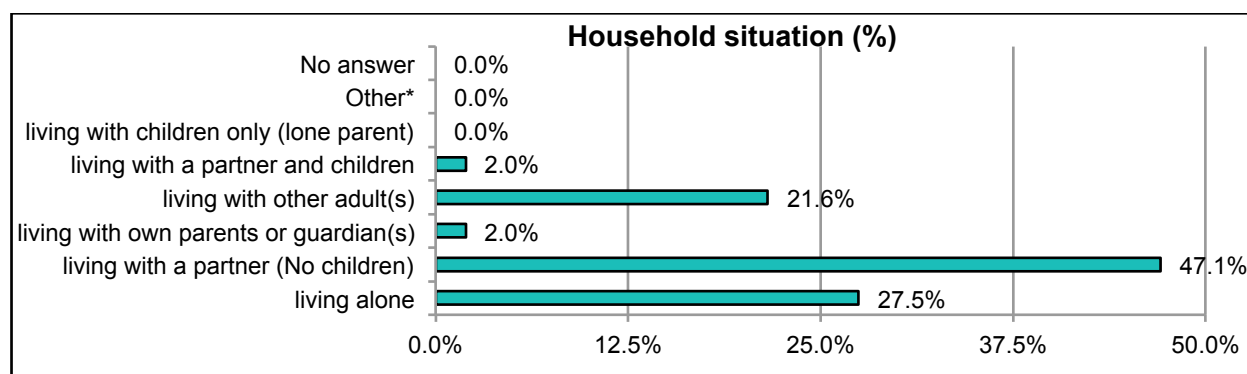


Figure 52: Household situation. Total sample: 51 respondents.

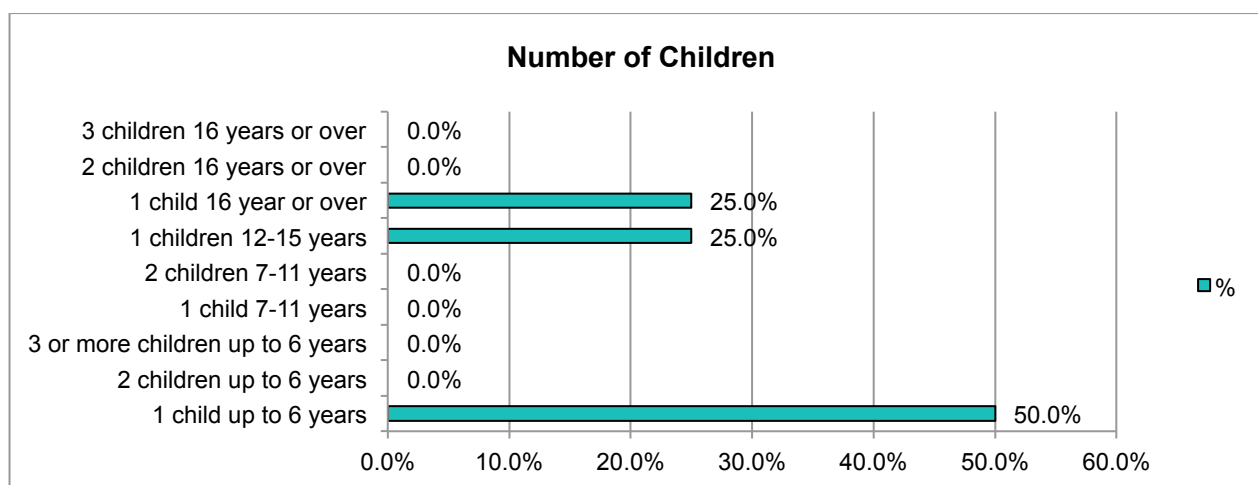


Figure 53: Number of children. Total sample: 51 (2% have children).

Housing situation

The majority of respondents (86,3%) lived in blocks of flats, as would be expected given that this is the dominant type of housing in the city of Darmstadt (see Figure 7). The second group consists of people living in detached and semi-detached houses, which are mostly old houses that survived the Second World War or in new urban developments in the surroundings of the city.

In addition, around 49% of the respondents have access to a private garden.

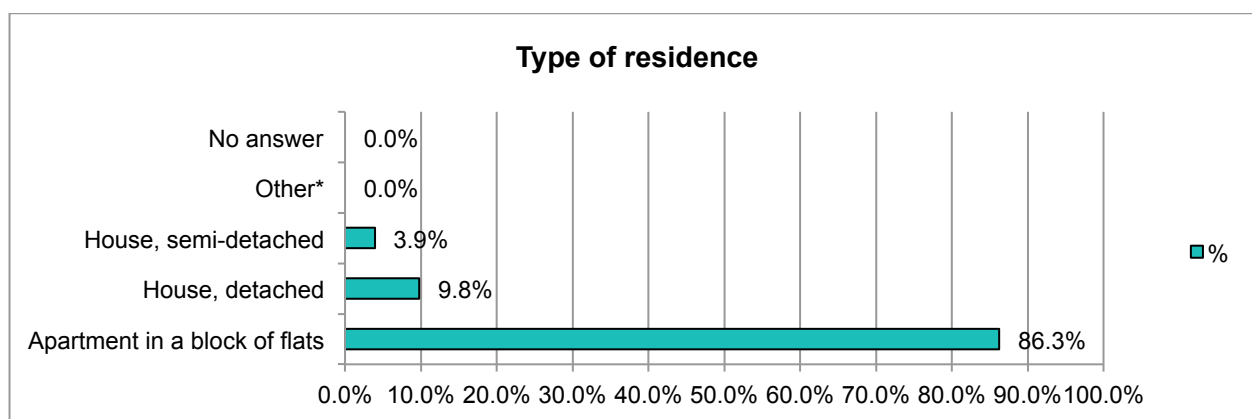


Figure 54: Type of residence. Total sample: 119 respondents.

2.2 Patterns of behaviour/use of urban open space

The citizens of Darmstadt visit not only local open spaces but also non- local spaces that are inside and outside the city. While a big majority of the sample (70,6%) visit open spaces in and outside of Darmstadt, only 7,8% visit local spaces in the neighbourhood (see Figure 8). From these facts it can be asserted that the open space users search for a variety of spaces and those local and non-local open spaces have a good accessibility and connectivity with public transport easy to reach.

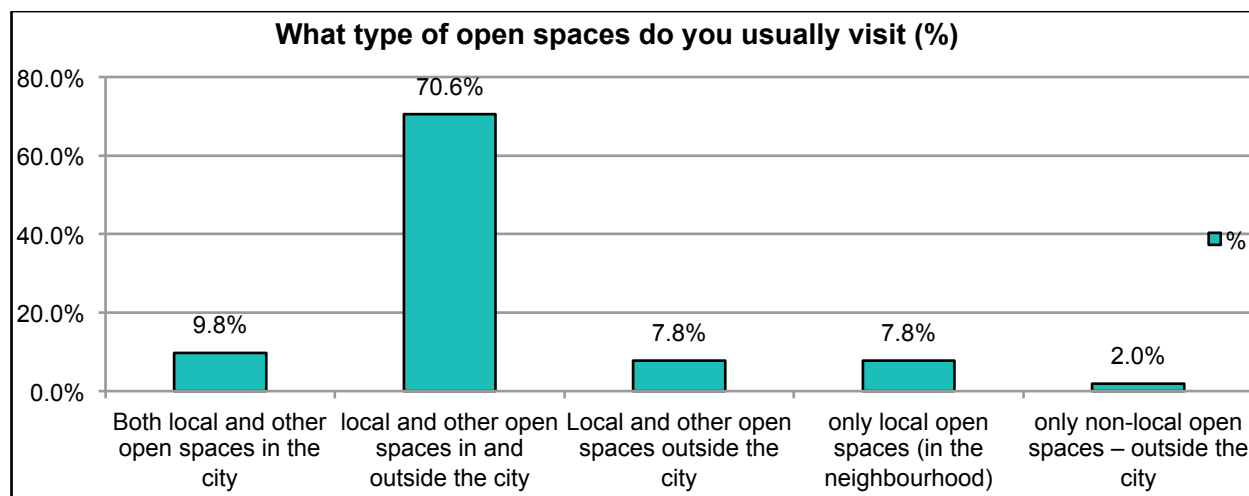


Figure 55: Types of open spaces visited. Total sample: 51 respondents.

Frequency and duration of visits

The open spaces of the city are intensively used. A great part of the respondents answered that they visit the open spaces two or more times per week (51%) (see Figure 9) and that the length of the visit lasts up to half an hour (37,3%) (see Figure 10). This shows that almost the half of the Darmstadt citizens have an active usage of the space, which goes with the trend of the country. In Germany, 42% of the population exercises or practices sports in an open space (e.g. parks) (EU Commission,2013).

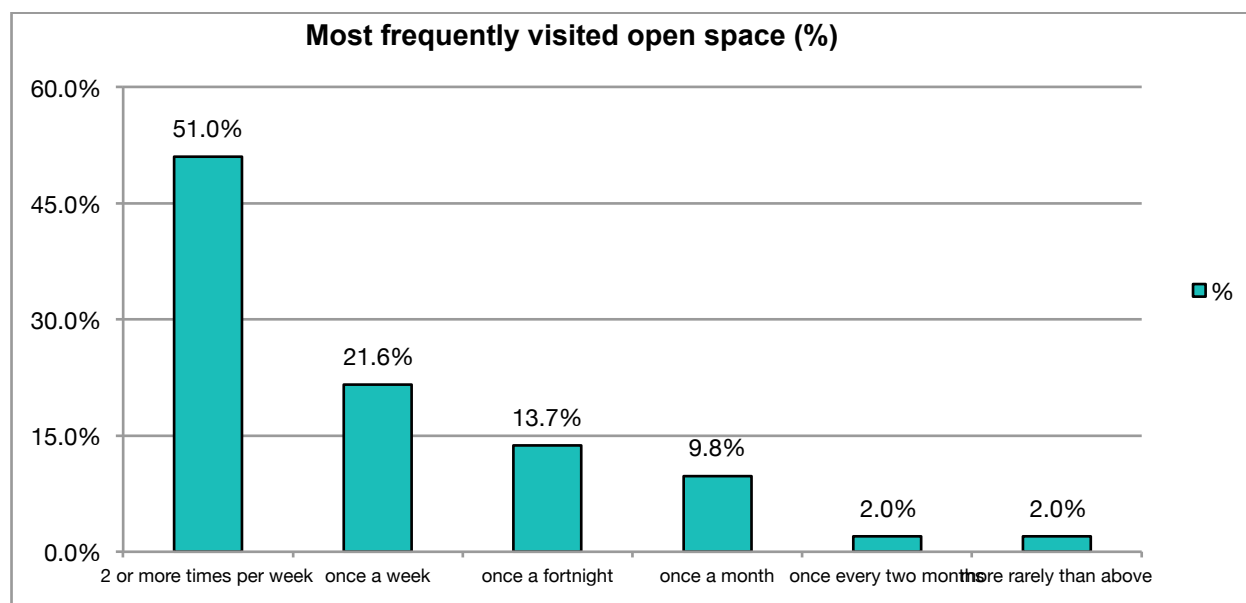


Figure 56: Most frequently visited open space. Total sample: 51 respondents.

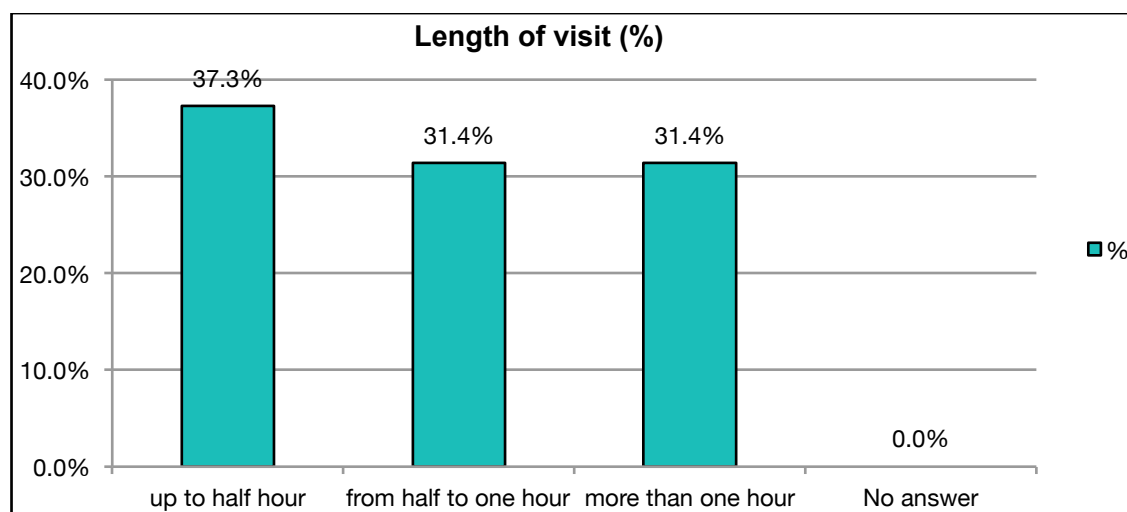


Figure 57: Length of the visit of open spaces. Total sample: 51 respondents.

Activities during the visit

The visitors of the open public spaces perform different activities during their stay at the open space: walk or jog around or through the open space (74,5%) is on the first place followed by rest and relax (35,3%) and meet with other people or socialize (29,4%) (see Figure 11).

The activities that are less performed by the visitors in the open space are: take the children to the playground and practice a sport. It can be assumed that these activities are less performed due to the lack of availability of facilities to cycle or to do sports.

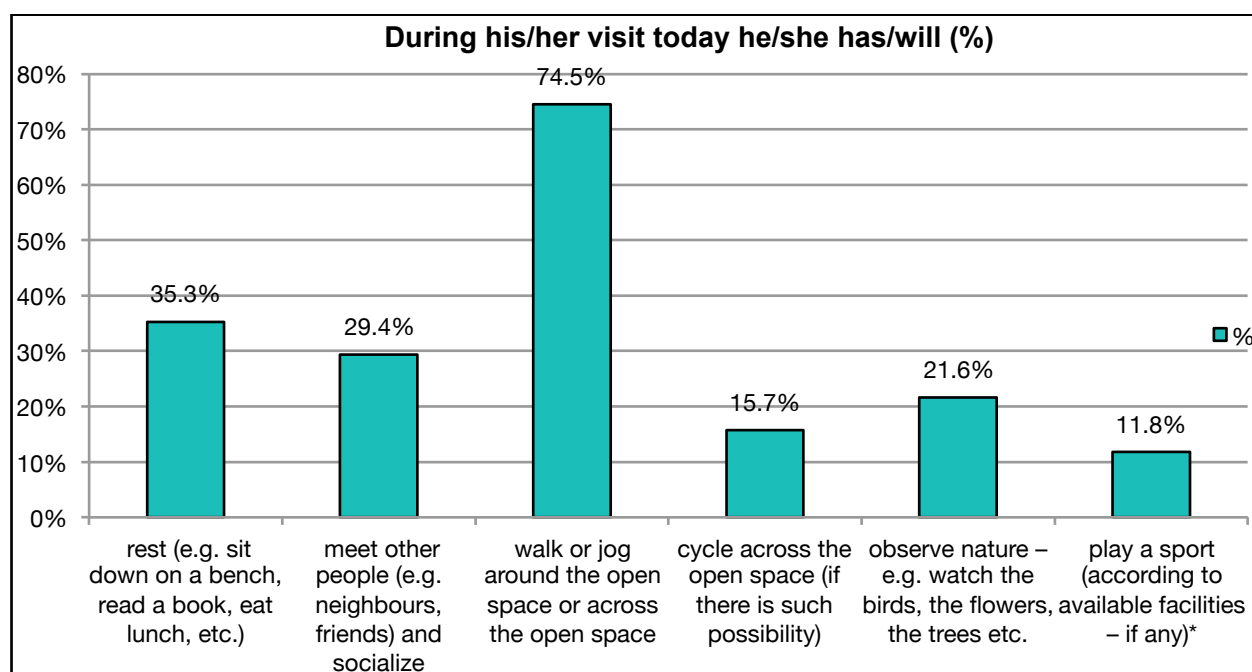


Figure 58: Activities during the visit of the open space. Total sample: 51 respondents.

Company during visits

Less than 60% of the users of the open public spaces are accompanied by other adults (52,9%) or by children (3,9%). More than one third of the users come alone (41,2%) (see Figure 12). Other companions are dogs.

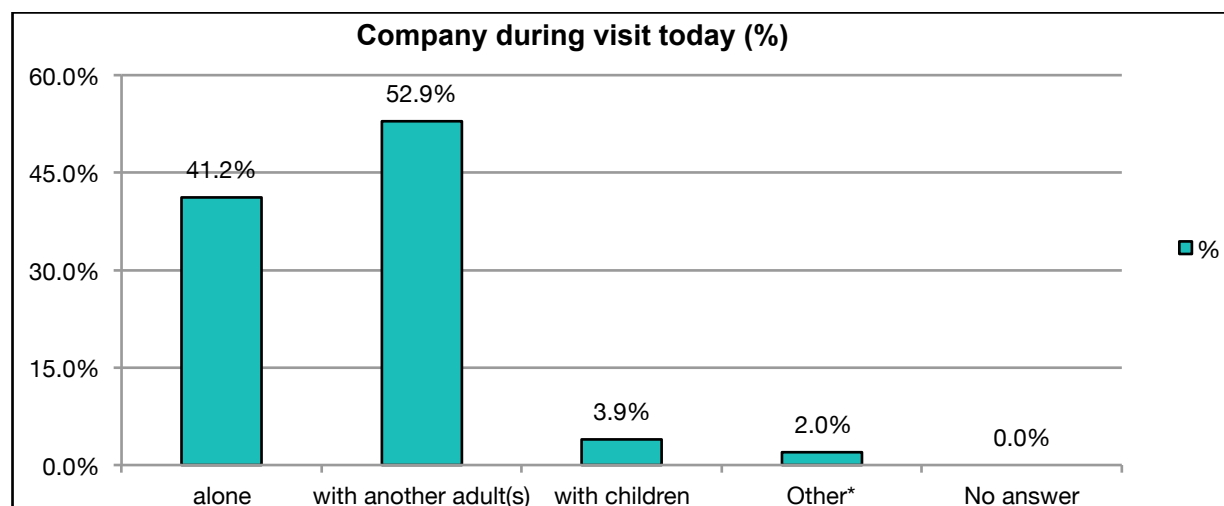


Figure 59: Company during the visit of the space. Total sample: 51 respondents.

Access to open spaces

The group of respondents can be divided in two groups: the ones who have to walk until 10 minutes to reach the space (49%) and the ones who have to walk between 11 and 20 or more minutes (51%). Still, the most common way to visit the open spaces is on foot (60,8%). The second transport mode to visit the open spaces is public transport (23,5%) (see Figures 13 and 14).

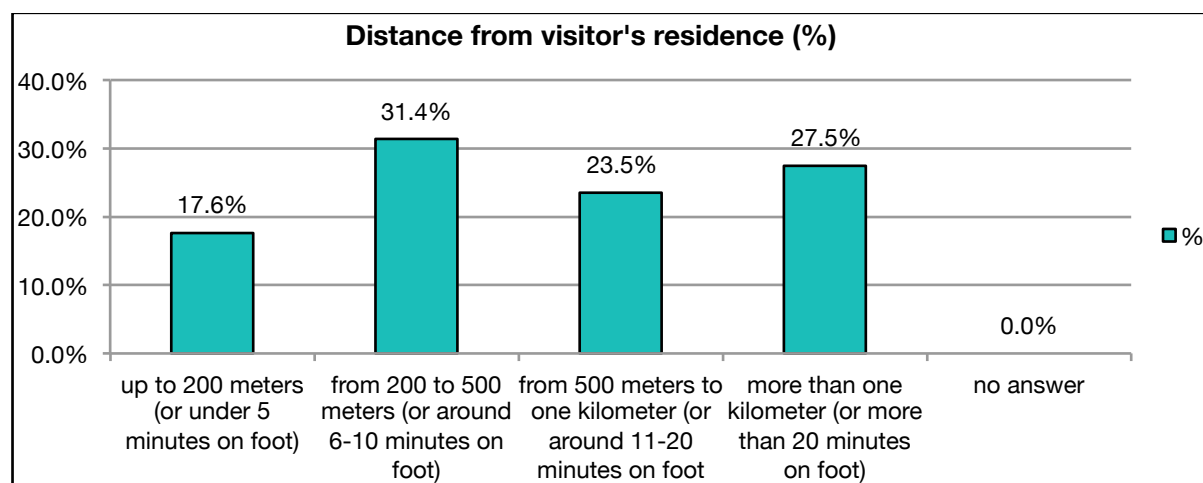


Figure 60: Distance of the open space from visitor's residence. Total sample: 51 respondents.

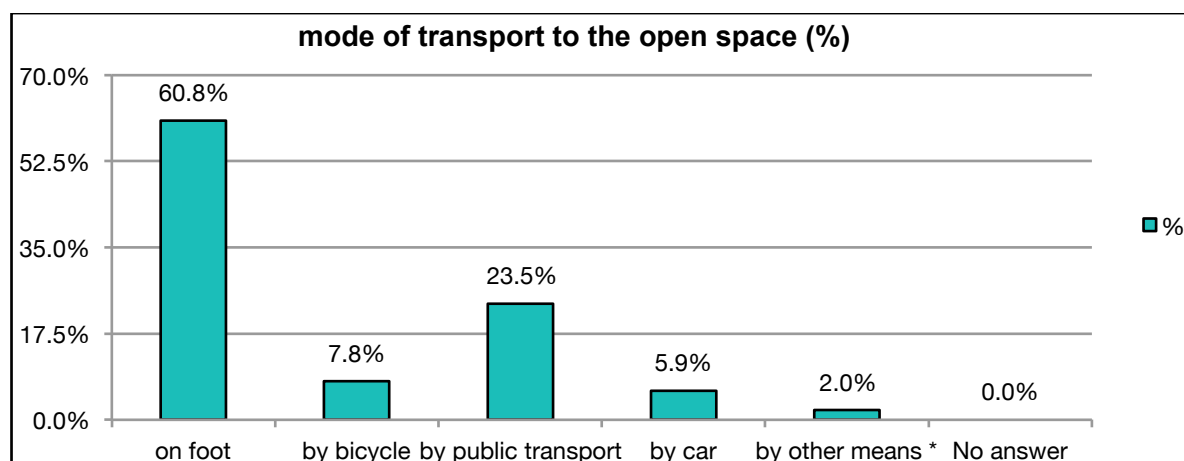


Figure 61: Mode of transport to the open space. Total sample: 51 respondents.

2.3 Benefits and improvements

Improvements

It is interesting that the majority of the respondents (43.1%) of the online survey answered that they would not do any differently as they do now. It could be speculated that the respondents are quite satisfied with the open spaces of the city of Darmstadt and the activities that one can perform there. To exercise at an outdoor gym is the second activity desired by the respondents (by 29,4%) and walk or jog across the open space as a third activity with an 21,6% (see Figure 15).

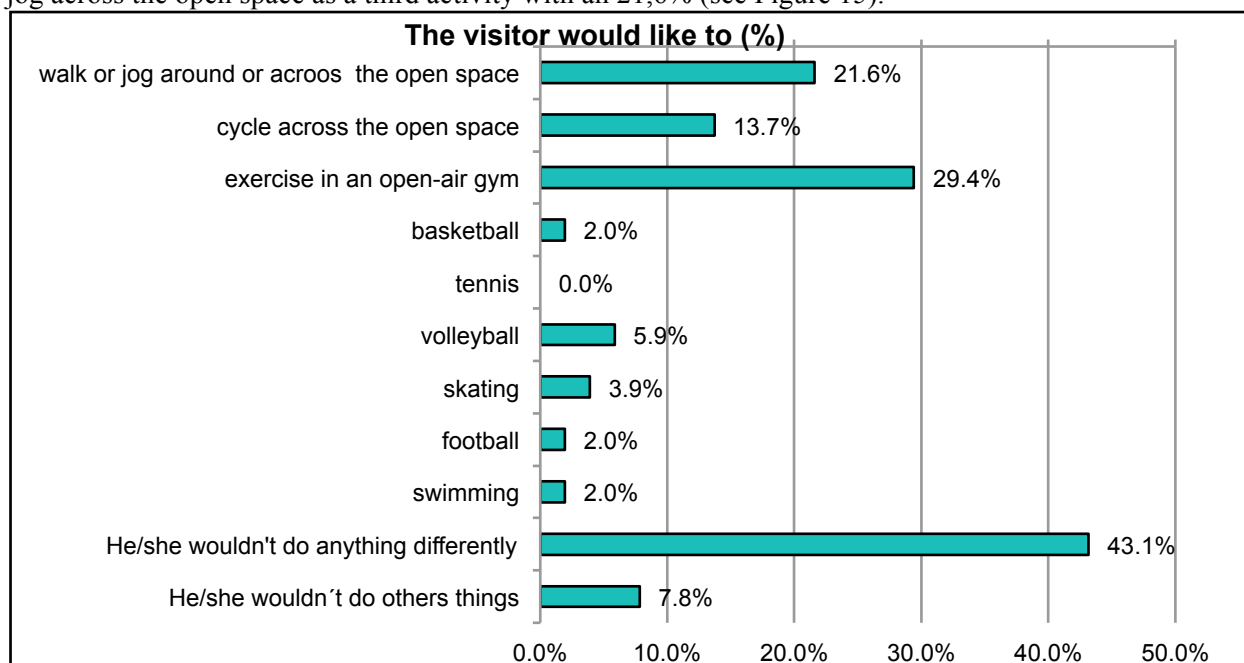


Figure 62: Desired activities by the visitors (multiple choice questions – total answers exceed 100%). Total sample: 51 respondents.

In addition, the users expressed what kind of improvement they would like to see in the open spaces. The improvements encompass on the first place, free drinking water; on the second place, benches or other urban furniture; on the third place, other improvements as sheltering options, access to toilets, no loud children, no ducks and geese (see Figure 16). It is interesting to notice that in the category of “other improvements” the majority answered “sheltering options” and it could be assumed that this is needed because of long, cold and rainy seasons in Germany.

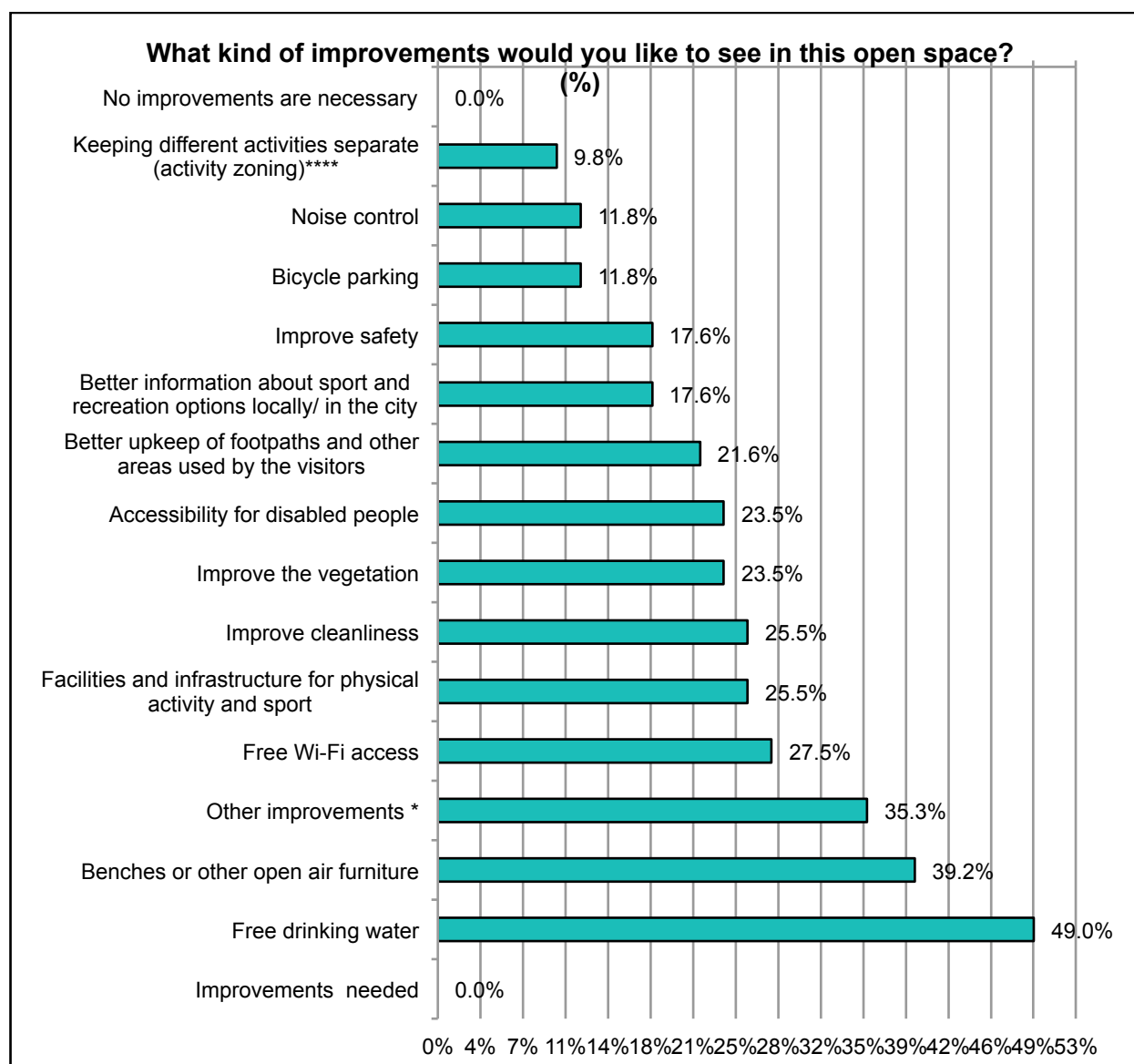


Figure 63: Desired improvements on the open spaces (multiple choice questions – total answers exceed 100%). Total sample: 51 respondents.

Despite the lack of interest on improving something in the open space, the citizens expressed that they are more or less satisfied with the open space (56,9%) and only 27,5% are satisfied with the open spaces (see Figure 17).

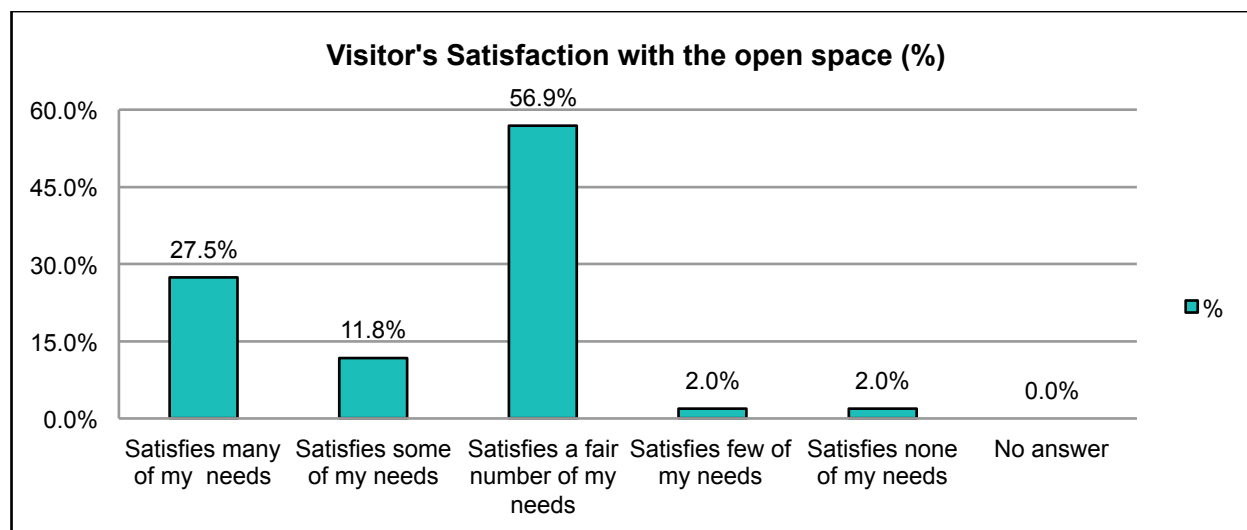


Figure 64: Visitor's satisfaction with the open space. Total sample: 51 respondents.

2.4 Lifestyle of users

More than the half of the respondents (68,6%) spend between 7 and 12 hours per day sitting, and 23,5% spend between 2 and 6 hours (see figure 18). This fact reflects the sedentary lifestyle of the citizens, of which the majority are students or employed full-time, mostly in sedentary jobs (offices).

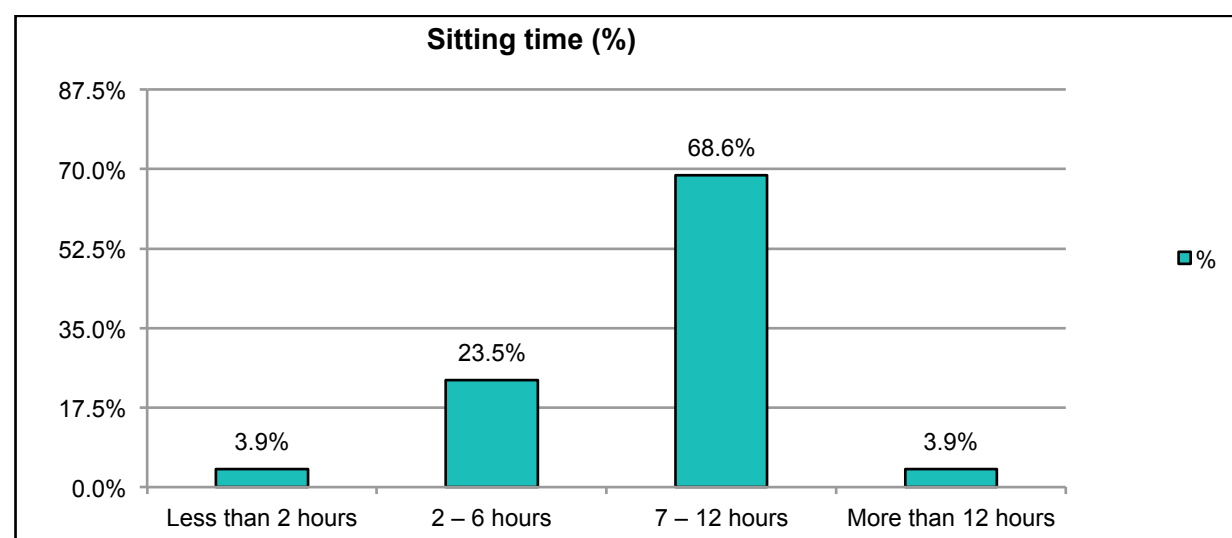


Figure 65: % of sitting time of the visitors. Total sample: 51 respondents.

Around 90 % of the users of the open spaces enjoy having more than 2 hours of free time. 13,7% of the respondents have less than 2 hours of free time (see Figure 31).

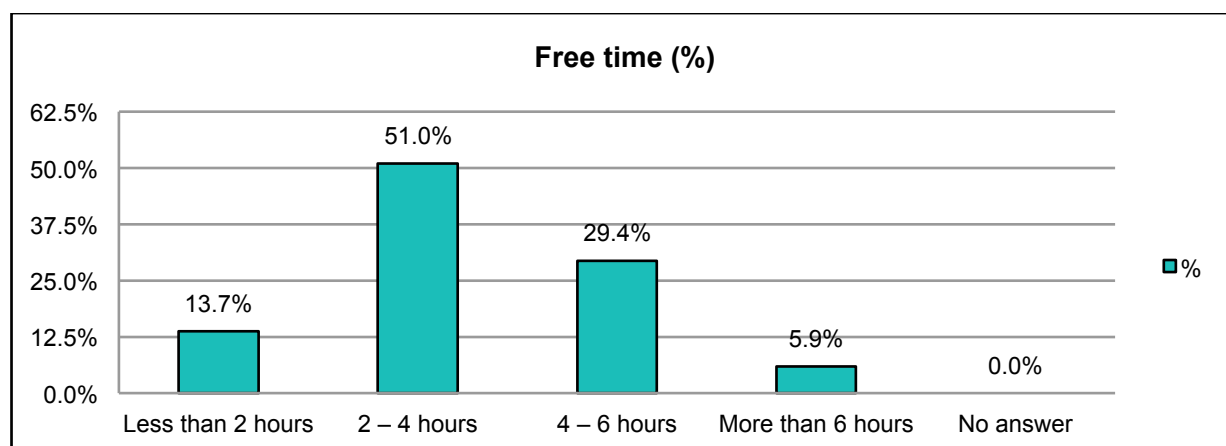


Figure 66: % of free time of the visitors of the open space. Total sample: 51 respondents

Around 50% of the respondents state that they suffer from much stress and very much stress (see Figure 20).

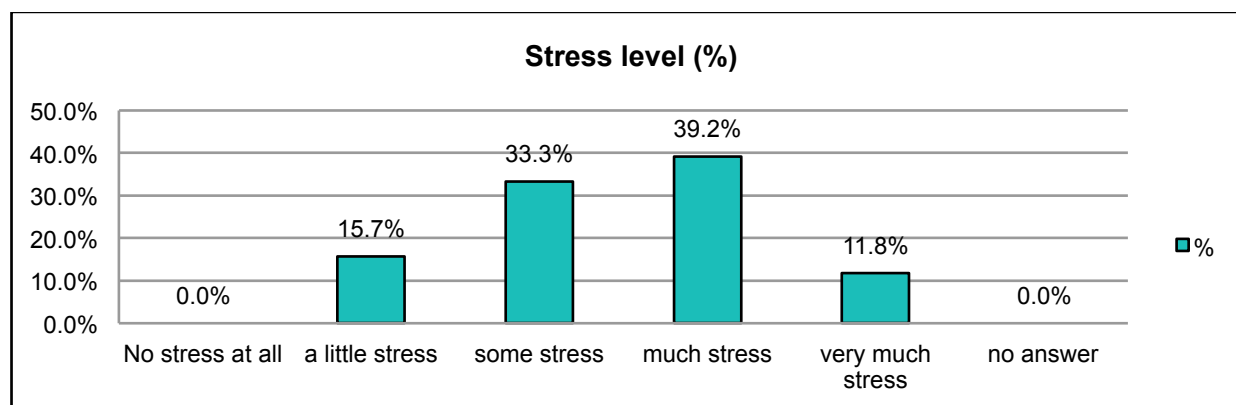


Figure 67: Stress level of the visitors in general. Total sample: 51 respondents.

Physical Activity

Respondents were asked to report about any physical activity they may have undertaken during the past month from a list of 12 indoor and outdoor activity options.

All respondents report to have undertaken one or more activities -mostly outdoors, except for gym- and included other activities, not in the list as yoga, table tennis, badminton, rehabilitation exercises, play boules. Cycling was reported by the majority (45,1%), followed by walking (43,1%) and jogging/running (39,2%).

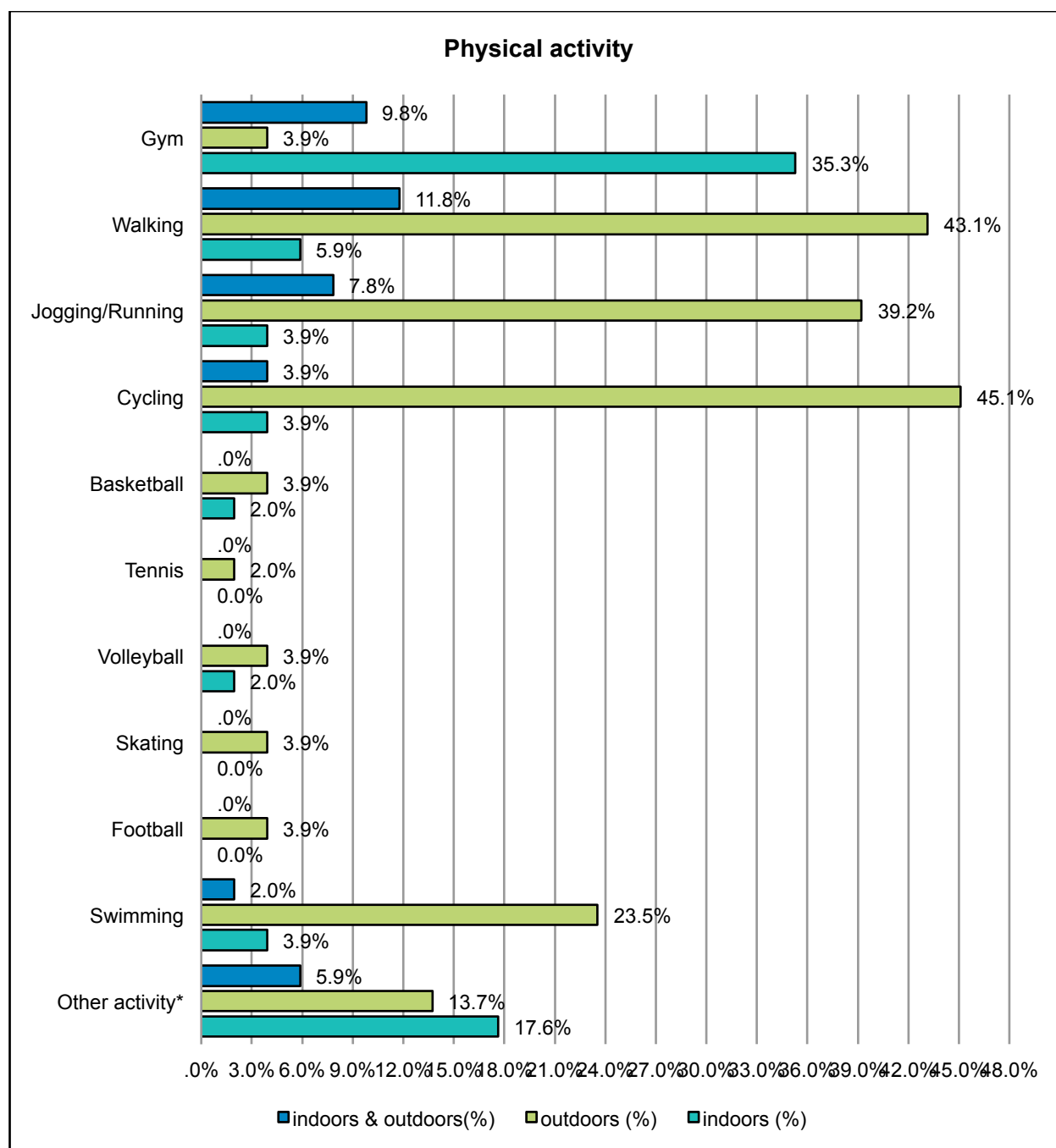


Figure 68: Physical activity performed during the last month. Total sample: 51 respondents (multiple choice question, may exceed 100%).

Digital technology

The vast majority (66,7%) of the respondents use social media apps outdoors (e.g. Facebook), 11,8% use urban or location-based games and 7,8% use fitness apps.

Therefore, there is a great potential to develop a location-based game that enhances physical activity among the German population.

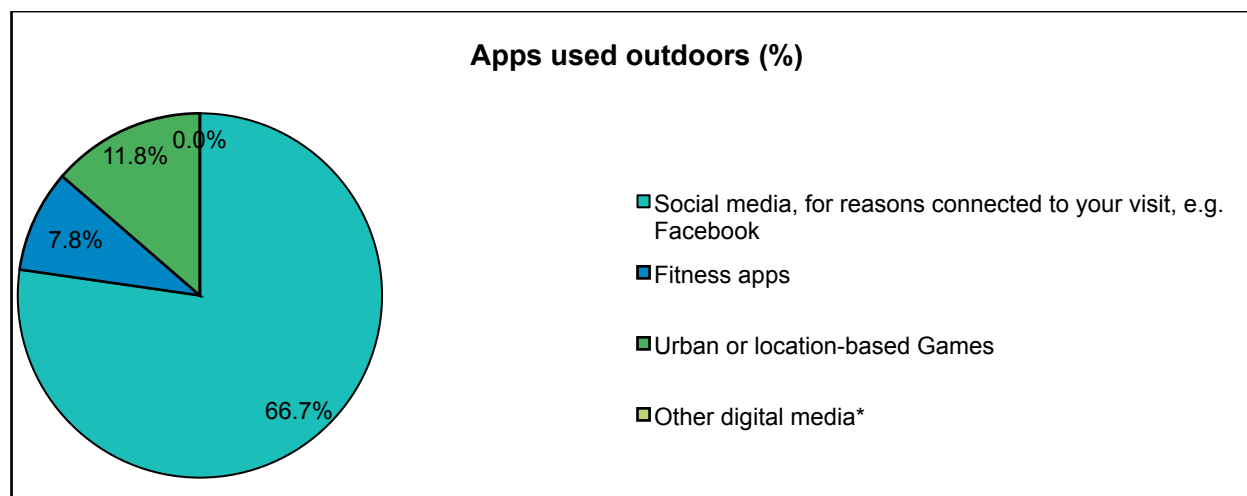


Figure 69: Apps used outdoors. Total sample: 51 respondents.

3. What influences the open space users' behaviour?

This section should explore the influence that the respondents' profiles may or may not have on the users' patterns of behaviour when using open spaces. Nevertheless, since the number of respondents was too low, and the sample was not representative for all types of socio-economic groups, correlations were not strong or significant to derive trends or patterns.

The next correlation table shows significant correlations at an average level (*) and at a significant level (**) of all the dependent and independent variables. The blank cells show no correlation at all. The subdivision of the variable 7 was not considered due to the small sample size.

Table 2: Correlations between the user behaviour in open spaces (dependent variables) and the demographic and socio-economic characteristics (independent variables).

Demographic and socio-economic characteristics	User behaviour in open spaces								
	V1 - Sex	V2 - Age	V3 - Education level	V4 - Are you...	V5 - Are you working in	V6 - Are you working	V7 - Household situation	V9 - Type of residence	V10 - Access to private garden
V11 - What type of open spaces do you usually visit									
V12 - How often have you visited this	,304*								

open space (on average) over the past 6 months?									
V13 - How long is your visit to this open space (on average)									
V14 - During his/her visit she/he - rest (e.g. sit down on a bench, read a book, eat lunch, etc.)			-,314*	,291*					
V14 - During his/her visit she/he - meet other people (e.g. neighbours, friends) and socialize	,319*		- ,403**						
V14 - During his/her visit she/he - walk or jog around the open space or across the open space									
V14 - During his/her visit she/he - cycle across the open space (if there is such possibility)									
V14 - During his/her visit she/he - observe nature – e.g. watch the birds, the flowers, the									

trees etc.									
V14 - During his/her visit she/he - play a sport (according to available facilities – if any)									
V14 - During his/her visit she/he - dog walking									
V14 - During his/her visit she/he - taking the children to the playground									
V14 - During his/her visit she/he - Other									
V15 - Are you today visiting the open space alone or accompanied							,295*		

When examining closely the variables that show a possible correlation, it appears to be a weak or almost no correlation, since as stated before, the sample was too small and not representative.

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- Wissenschaftsstadt Darmstadt, Amt für Wirtschaft und Stadtentwicklung, Statistik und Stadtforschung (2016). *Bürgerumfrage 2015 in der Wissenschaftsstadt Darmstadt. Statistische Mitteilungen 1/2016*. Available at: https://www.darmstadt.de/fileadmin/Bilder-Rubriken/Standort/Statistik_und_Stadtforschung/pdf/statmitteilungen/SM_BU2015_Internet.pdf
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